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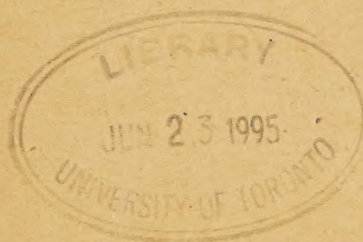
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# NATURAL RESOURCES CANADA

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Vol. 3

JULY, 1924

No. 7

## C. G. S. "ARCTIC" SAILS ON ANNUAL NORTHERN PATROL

CARRIES SUPPLIES AND  
MEN FOR POSTS

Expedition will Conduct Extensive Radio Tests—  
Has Mail For Capt. MacMillan of  
"Bowdoin"

In the course of the regular patrol of the Arctic archipelago and the provisioning of posts in the Franklin district, Northwest Territories, the Canadian Government Steamship *Arctic* sailed from Quebec on July 5 for the north. Unavoidable delays in refitting the new ship *Franklin* in England prevented her use on this voyage and the *Arctic*, after the necessary repairs in the dry-dock at Lauzon, Quebec, was again outfitted for the trip. Mr. F. D. Henderson, D.L.S., represents the Department of the Interior on the expedition as Mr. J. D. Craig, the Departmental Officer in Charge, was unable to leave Ottawa, and the ship is, as usual, under the command of Captain Bernier. Dr. Livingstone again accompanies the expedition as Medical Officer and Mr. J. D. Soper, of the University of Alberta, who was Naturalist of last year's expedition, goes north under the auspices of the Victoria Memorial Museum, and will spend some fifteen months in the Cumberland Sound region engaged in scientific research. Mr. Geo. H. Valiquette, who accompanied the expeditions of 1922 and 1923 as cinematographer, is now in Japan with Lieut.-Col. Broom in connection with the laying down of supply depots for the British Round-the-World flier, Major A. S. C. McLaren, and the cinematographic work this year will be done by Mr. Ray Tash, of Toronto, who has had a wide experience photographing for the Ontario Government.

A number of Federal Government officials who have been in the north for some time will return with the expedition to Quebec in the fall. These include Major L. T. Burwash, exploratory engineer, who has been carrying on general investigatory and exploratory work during the past year with Pangnirtung, Baffin island, as his base, and Inspector C. E. Wilcox and Sergeant A. H. Joy, of the Royal Canadian Mounted Police, who have been in the north since 1922 and 1921 respectively.

All of the posts in the archipelago will be visited and re-provisioned for another twelve months and it is possible that one or two new posts will be established. The *Arctic* also carries a

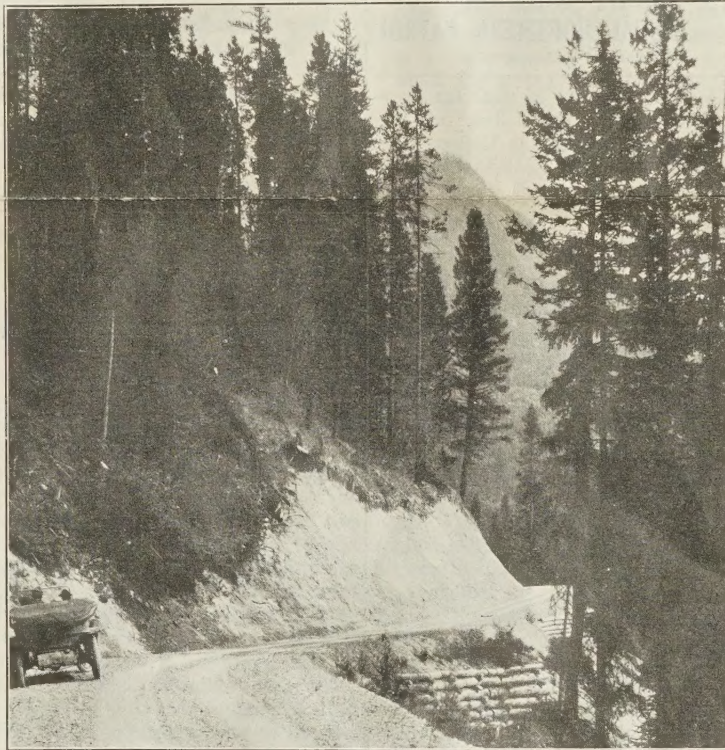
(Continued on page 2)

## OUTDOOR RECREATION CONFERENCE

Importance of Recreation From National Health Standpoint  
—Canada Participates in Washington Meeting

A great forward movement in conservation, and one that affects Canada profoundly, was inaugurated by President Coolidge in the convoking at Washington, May 22 to 24, of the first National Outdoor Recreation Conference. At this conference, which em-

waters, pollution of streams, international games, and international recreational travel. The Dominion is already in touch with these subjects at a dozen points and the chief work of the conference was to emphasize and organize the activities they involve.



Recreation and National Efficiency—A splendid stretch of motor road through one of Canada's great scenic playgrounds—Banff-Windermere highway, Kootenay National Park.

braced national and state organizations, Canada was represented upon the special invitation of the President of the United States. It was intended that Canada should be represented by Mr. W. W. Cory, Deputy Minister of the Department of the Interior, and Mr. J. B. Harkin, Commissioner of Canadian National Parks. Owing to unforeseen circumstances Mr. Harkin was prevented from attending and to Mr. Cory fell the duty of acting for Canada at the various meetings of the conference.

Canada could not remain aloof from a conference of this kind even should she desire to do so, because outdoor recreation, in the broad terms in which it was dealt with on this occasion, involves the international guardianship of fish, migratory birds, boundary

The personnel of the conference indicates the important place the subject occupies in the minds of the leading men of the United States. It was called and opened by President Coolidge, and the executive chairman was Hon. Theodore Roosevelt, Assistant Secretary of the Navy. Other members of the United States cabinet who took part were: Hon. J. W. Weeks, Secretary of War; Hon. Hubert Work, Secretary of the Interior; Hon. H. C. Wallace, Secretary of Agriculture; Hon. Herbert Hoover, Secretary of Commerce; and Hon. J. J. Davis, Secretary of Labour.

Arrangements were completed by which the people interested in the various forms of outdoor recreation will be fully represented on the permanent

(Continued on page 3)

## ALL-BRITISH AND CANADIAN COAL SUPPLY THE AIM\*

OBJECT OF PARLIAMENT  
BEING ATTAINED

Growing Demand For Welsh and Scottish  
Anthracite in Canada—  
Beneficial Effects

The House of Commons in its discussion on the 31st of March, 1924, of the fuel shortage in Ontario and Quebec in 1922, arrived at the conclusion which was expressed in a resolution that the time had arrived for Canada to have a national policy in relation to its coal supply, and that no part of Canada should be left dependent on the United States. The same resolution expressed the opinion that the Government should immediately consider the initiation of an all-British and Canadian coal supply. A means of giving effect to one phase of this resolution had already been pointed out by reports prepared under the direction of the Honourable Charles Stewart, dealing with the desirability of developing a permanent market for British anthracite in Canada. In view of this it is important to note that the imports of Welsh and Scottish anthracite into Canada, which began in 1922, increased largely in 1923 and promise to still further increase this year. The amount imported in 1922 was 180,000 tons and in 1923, 262,000 tons, an increase of nearly one-half. Of the quantity imported about 90 per cent has graded as of "domestic" size and has in consequence commanded the best market prices. In this connection, however, it should be borne in mind that the 1923 figures cover a full year's trade movement, while those for 1922 may be said to be confined to the summer and autumn period, following the visit to England of a representative of the Canadian Department of Mines.

Nevertheless, the 1923 development must be considered highly favourable since it has taken place through a comparatively small number of dealers, often without facilities for crushing and grading, in competition with supplies of United States anthracite which are again plentiful, and in view of the increased attention devoted by the Dominion Fuel Board to the possibilities of domestic coke. Moreover, certain prejudices against the British product

\*Prepared under the direction of Dr. Charles Camsell, Chairman, Dominion Fuel Board.

(Continued on page 3)



# THE MENACE OF THE GIPSY MOTH\* MANUFACTURE OF CARBON BLACK

## Dominion Department of Agriculture and Quebec Forest Service Co-operate in Preventive Measures

The appearance of the gipsy moth (*Porthetria dispar*) near Alburg, Vermont, about half a mile south of the Canada-United States boundary has given rise to conditions affecting natural resources and their utilization of which the Government of Canada, as well as that of the province of Quebec, ever on the alert to protect the interests of citizens, have taken cognizance. As a result of the discovery of this infestation, the United States Government intend to place an embargo on that area of southern Quebec in general about 10 miles in width immediately adjoining the International Boundary to prohibit the shipment of Christmas trees and Christmas greens to the United States. The shipping of such trees or greens from the Vermont area to other parts of the United States has already been prohibited by state legislation.

The consequences which arise from this situation are important. In the first place there is the danger to our resources should the pest really gain a foothold in Canada and there is the immediate stoppage of the sale of Christmas trees and Christmas greens from this part of Quebec. No shipment from such area will be allowed entry into the United States of the following: spruce, fir, hemlock, pine, juniper, and cedar; and holly and laurel.

The importance of protecting our forest and other trees from such a pest as the dreaded gipsy moth, has been appreciated by the Department of Agriculture for many years, and in addition to introducing into Eastern Canada large numbers of parasites of the insect, collected in infested areas in the New England States, Dominion officers have carried on scouting to a limited extent in the province of Quebec. Without going into details it may be explained that insects like the gipsy moth have their parasites which attack and destroy them, and the breeding of these parasites and the releasing of them in infested areas is one of the means used in fighting these pests.

In dealing with the present situation the Department of Agriculture will also place a domestic quarantine on the same area. In addition to the area upon which the embargo will be placed, there will, it is expected, be a restricted area, also about 10 miles in width immediately adjoining. Under the proposed regulation Christmas trees and Christmas greens may be moved from the restricted area provided the shipments are accompanied by a Dominion certificate of origin which states that the trees or greens were grown at some point within the restricted area or outside of the quarantined area.

The Entomological Branch of the Department of Agriculture will this summer and autumn, in close co-operation with the Department of Lands and Forests of the Quebec Government, conduct intensive scouting throughout southern Quebec. Federal and provincial officers will combine to form small crews to examine trees, fences, posts, etc., along roads, railways, in orchards, as well as scout other places where it is thought the gipsy moth may have become established.

Few insects have been so costly as has the gipsy moth. Millions of dollars have been spent in its control dur-

ing the last fifteen years in the New England States, and it would indeed be serious if infestations are found in Canada. Important areas of woodland trees have been killed outright in areas where it has gained a foothold. Apple, oak, birch, alder, and willow are the favoured trees upon which the caterpillars feed. Other trees such as beech, poplar, hickory, etc., have been seriously injured. In the New England States too, pine and other coniferous trees mixed with deciduous growth have suffered severely.

Citizens who desire to receive further information regarding this pest should communicate either with the Dominion Entomologist, Department of Agriculture, Ottawa, or the Provincial Entomologist, Department of Agriculture, Quebec.

*\*Prepared under the direction of Dr. J. H. Grisdale, Deputy Minister, Department of Agriculture, by Mr. Arthur Gibson, Dominion Entomologist, Ottawa.*

## C. G. S. "ARCTIC" SAILS ON ANNUAL NORTHERN PATROL

(Continued from page 1)

considerable quantity of mail for Captain Donald B. MacMillan, of the *Bowdoin*, who wintered at Refuge Harbour, just north of Etah, Greenland. The Officer in Charge of the 1924 expedition has volunteered to deliver the mail, if possible, and an attempt will be made by wireless to arrange a rendezvous so that Captain MacMillan may be given his mail.

The expedition this year has an added interest owing to the fact that a much more extensive test of radio work will be made than on previous voyages. The *Arctic* as on past voyages carries two regular commercial radio equipments, one a standard 2 K.W. spark set for communication on 600 metres with the regular commercial stations around the gulf of St. Lawrence and in Labrador, and the vessels which may be encountered en route; the other set, a continuous wave transmitter with which communication will be maintained with the long distance ship-station at Louisburg, Nova Scotia, on 2,100 metres. In addition to these two radio sets the *Arctic* is also fitted with a special short wave I.C.W. outfit designed for transmission on wave-lengths between 100 and 150 metres. This short-wave installation is being fitted for the purpose of carrying on tests with Canadian and United States amateur stations in order to obtain data on the reception of short-wave signals during the long daylight periods which prevail in latitudes of the far north. The Radio Branch of the Department of Marine and Fisheries, which is responsible for the installation and operation of the radio equipment on the *Arctic*, has requested the co-operation of all those operating amateur transmitting stations in North America to assist in these tests so that as much data as possible may be obtained.

The short-wave watches which will be maintained are as follows: Call Sign, VDM; Wave-length, 120 metres; daily, except Wednesday, 11 p.m. to midnight; Saturday only, 11 p.m. to 3 a.m. (Eastern Standard Time).

## Utilization of Natural Gas for This Purpose Carefully Regulated in Permits Granted

Within the past year there have been many applications for the right to manufacture carbon black in Canada and for the acquisition of natural gas-producing fields with a view to commercial exploitation. In view of this interest the following facts are given concerning the situation.

Carbon black is a fluffy, velvety, black material produced by burning natural gas, with a restricted air supply, against a metal surface. It is in fact a species of lamp black but possesses certain unique and valuable qualities that cannot be claimed for any other substance, and in consequence as a commercial product it is becoming of increasing importance. The chief qualities that distinguish it are its remarkable fineness, lustrous colour, freedom from grit, general adaptability as a pigment when mixed with oils, and toughening properties in rubber compounds. It is bulky—one pound to the cubic foot—and its handling, therefore, demands good transportation facilities. Its chief uses are as a filler in rubber compounds (particularly those used in making automobile tires), printers' ink, black and grey paints and enamels, stove and boot polishes, phonograph records, buttons, typewriter carbon paper, glazed paper, crayons, tarpaulins, black leather, Chinese and India inks, insulating materials, and in fact, in almost all articles in which a black filler is used.

The manufacture of carbon black is a simple process presenting no chemical or mechanical difficulties, and requiring no unduly large capitalization. There are, however, two essentials: a supply of very cheap natural gas, assured as to quality and continuity of flow, and adequate transportation facilities. Its production has hitherto been confined to the United States, where large supplies of natural gas are found. The importance of extensive and easily developed gas fields is obvious, since this is the largest item of expense and the only raw product required in the process. If there is sufficient gasoline in the gas being treated for carbon black, this may be extracted before the gas is burned for its carbon content.

Current production, about seventy million pounds annually, is largely restricted to certain sections of West Virginia and Louisiana, where other uses are not a serious claim. Similarly it is indicated, for this reason, that future operations in the United States will for the most part remain confined to the areas already under active exploitation, so that any permanent increase in market demand must in part be met from other sources of supply. As about one-third of the United States production is exported Canadian producers would of necessity depend largely on the Canadian market, which consumes normally over two million pounds annually, and on the world market in which Great Britain, Australia, and the Orient are large factors.

Attention has been directed to Canada as a source of supply because of her large fields of natural gas, and particularly because of the gas discovered during the extensive drilling for petroleum now proceeding in Western Canada. During the drilling operations large flows of natural gas are often struck.

While the drilling for oil is continued the gas wastes and if no oil is found the casing is capped and gas left unused. Representations were made to the Government that the gas thus struck might be used for the manufacture of carbon black. These proposals were carefully investigated by the Department of the Interior and regulations were established to guard the public while permitting the desired development. It was decided to permit the use of gas for the manufacture of carbon black in isolated localities where there is no present or reasonably prospective market for gas for domestic or industrial purposes. Under the regulation it is also a condition of each permit issued that if, during the period thereof, a community or company, holding a franchise to supply natural gas to any centre of population, constructs a pipe line to the wells supplying the carbon-black plant, the volume of gas required to supply such centre of population through the pipe line shall at all times be available up to the capacity of the wells, the carbon-black plant to have the right to use the surplus gas only, and the selling price of the gas at the well to be determined by arbitration.

After a careful study of the circumstances in each case, two permits to manufacture carbon black have been granted under the regulations, one in the Wainwright field and the other in the Peace River field. It is understood the permittees are proceeding with the erection of the necessary plants for their operations. Other applications are under consideration.

## NEW SECTIONAL MAPS

Two new sheets of the Sectional Map of Canada, the Moose Mountain sheet and the Medicine Hat sheet, have just been issued. The western edge of the area covered by the former sheet lies about sixty-six miles east of the city of Moose Jaw. The area covered by the latter includes the city of Medicine Hat. Each sheet is approximately 24 inches by 34 inches, on a scale of three miles to an inch, and shows by various colours detailed topography such as streams, lakes, roads, buildings, contours, telegraph and telephone lines, railways, post offices, etc.

These sheets may be obtained from the Topographical Survey of Canada, Department of the Interior, Ottawa, upon payment of the nominal fee of 25 cents each, or if they are desired in folder form of pocket size convenient for carrying around, the price is 50 cents.

Canada produces yearly about 20,000,000 pounds of maple sugar, of which 70 per cent comes from Quebec, 25 per cent from Ontario, and the remainder from the Maritime Provinces. By-products are fine vinegar, malic acid, and bimalate of lime.

In Canada copper is mainly derived from the nickel-copper ores of the Sudbury district, Ontario, and the copper-gold-silver ores of British Columbia. Recent years have witnessed the development of important deposits at Britannia and other points on the Pacific coast; at Copper Mountain near Princeton, British Columbia; and in the Pas district, northern Manitoba.



# NATURAL RESOURCES CANADA

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Minister

W. W. CORY, C.M.G.,  
Deputy Minister

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*Natural Resources, Canada*, is published in French as well as in English, and readers may have whichever edition they prefer.

OTTAWA, JULY, 1924

## TO ESTABLISH BROWN TROUT

### Rare Variety of Game Fish Being Introduced into New Brunswick

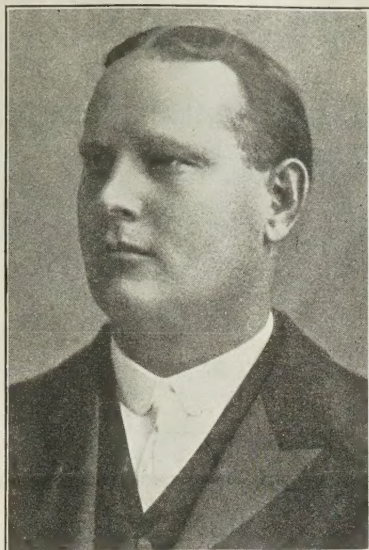
At the request of a number of public bodies of St. John, New Brunswick, the Department of Marine and Fisheries undertook to establish the European brown trout in loch Lomond near St. John. The first eggs for this purpose were obtained in January, 1921, from the United States Bureau of Fisheries. A small number of the fry from these eggs have been retained in the ponds at the hatchery, and in the autumn of 1923, when the fish were a little over two years old, a few of the larger and better developed yielded some 5,000 eggs, which are undergoing incubation. The eggs of the brown trout are not easily obtained in America, and in continuation of the stocking of loch Lomond, some 200,000 Loch Leven trout eggs, a variety closely related to the brown trout, were obtained through the United States Bureau of Fisheries in exchange for Atlantic salmon eggs. The Loch Leven trout eggs were secured from wild trout captured in the streams of Montana and are the result of small distributions of such fry made some years ago. An equal number of Loch Leven trout eggs are undergoing incubation in the Banff hatchery, and the resultant fry will be distributed in selected waters of the Prairie Provinces.

### USE OF WATER-POWER IN CANADA

In the central electric station industry, on which every city and town in Canada is dependent for light, heat, power, street railways and in many cases water supply, 97 per cent of the total output is obtained from water-power. In addition to this many industrial plants from coast to coast possess their own water-power plants. Both in use of electric energy per capita and in the proportion of electrically lighted abodes Canada exceeds the United States.

The most extensive, interesting, and readily accessible field for alpine climbers in the world to-day is found in the Canadian Rockies.

Canada's national parks are the greatest wild-life sanctuaries in the world. Wild animals roam at will with no fear of man.



W. W. Cory, C.M.G.  
Deputy Minister of the Interior, Canada.

## OUTDOOR RECREATION CONFERENCE

(Continued from page 1)

organization by their acknowledged leaders. These details need not be gone into here the point being this: that people everywhere now recognize the importance to the whole country of properly directed sport and recreation. The crowding of people into great urban centres on the one hand and the development of the automobile on the other have changed the outlook of the people of North America in regard to outdoor recreation in one generation.

The great majority of the people no longer have, as they had thirty years ago, open spaces near at hand for recreation, and the automobile has provided the means by which they may escape into the forests, the mountains, and along the watercourses. The holding of this conference indicates that people have suddenly awakened to the fact of which leaders in both Canada and the United States have been aware for some years that the health and efficiency of the nation are going to depend in no small degree upon the maintenance of national parks, game preserves, game sanctuaries, forest reserves, and other open areas, and upon the wise administration of proper laws respecting the protection of game animals, game and insectivorous birds, and fish. The view taken a few years ago was that national parks with their beautiful scenery and their wild animals living in a state of nature ministered only to the sentimental side of life but it is now seen that the very stamina of the nation is dependent upon these playgrounds, and Canada has shown that she does not intend to be behind any part of the continent in developing these safeguards for her people. This has been evidenced by what has been done in the establishment of national parks, in the creation of game preserves and sanctuaries, both in the settled parts of Canada and for the protection of natives in the far north, in the preservation of the buffalo as well as other large and small game animals and migratory birds, in the establishment of national forests, and in the holding of Empire and National Conferences on the conservation of forests, wild life, and public health. Activity in these different spheres has never been as great in Canada as it is at the present time, it is intended that there shall be no slackening but an increase of effort, and that the work already begun shall be extended and made more far-reaching and effective by further organization and co-operation.

## INVESTIGATIONS INTO STRENGTH OF TIMBERS

### Forest Products Laboratories Determine Effect of Rate of Growth in Commercial Woods

The effect of the rate of growth on the strength of Canadian woods has been the subject of investigation at the Forest Products Laboratories of the Forestry Branch, Department of the Interior, within the past year and considerable new knowledge has been secured.

The fact that rate of growth exercises an important influence on the mechanical properties of timber had been brought to light by previous research. It was known that in softwoods, such as pine and spruce, slowly grown material tended to be stronger than that of very rapid growth and that in the so-called ring-porous hardwoods, such as ash and oak, the reverse was true, slowly grown wood being inferior in strength to that of more rapid growth.

Analysis of the results of many thousands of strength tests, made at the Laboratories, has now enabled the investigators to go a step further and to determine definitely the rates of growth at which maximum strength is developed in a number of the important commercial woods of Canada. This information finds practical application in a large number of uses of wood in which the strength of the material is a primary consideration.

## ALL-BRITISH AND CANADIAN COAL SUPPLY THE AIM

(Continued from page 1)

had—and have yet—to be overcome as a result of some of the earlier shipments which were not properly screened. The supplies now available are understood to be uniformly high in quality and with the fine dust removed.

Quebec and Ontario dealers supplying both British and American hard coal report a small but a very definite and even insistent demand for the British product, including briquettes. Moreover, this demand is actively growing as certain qualities of the British coal are becoming more widely understood, namely: its small ash content (2 to 4 per cent); high heating values (14,600 B.T. Units); responsiveness under draught, both to pick up and throttle down.

It has been the uniform experience of those using this coal that it requires less attention either for stoking or ash-handling than similar grades of United States coal; there is less waste, and, everything considered, less expense. The objection to it is that it is brittle and tends to break up in handling.

Demand and prospects on the whole have been so satisfactory that certain prominent Welsh colliery interests have now completed requisite plans for the installation of a breaking and grading plant, with docks and railway sidings in Montreal. This plant will have a capacity for handling about 400,000 tons annually, and the owners plan on shipping to Canada at least 100,000 tons during the present year.

In regard to price, the British product, of course, competes with United States anthracite. Even in districts where the former has had to be sold at a higher price than the latter, the difference is counterbalanced by the superior quality of the British coal.

## PRODUCTION OF RAW FURS SHOWS INCREASE

### Greater Number of Pelts Taken in Canada in 1922-23—Decrease in Value

The production of raw furs both for home consumption and for export forms one of Canada's important industries, and during the season closed June 30, 1923, the number of pelts produced reached 4,963,996, valued at \$16,761,567. This was an increase in the number of pelts over the 1921-22 figure of 597,206 but a decrease in total value of \$677,300. This information as well as what follows is contained in a statement recently issued by the Dominion Bureau of Statistics.

As in the season of 1921-22, muskrat leads in order of value, the total number of pelts being 3,846,161 valued at \$5,077,886. Other high values were: white fox, \$3,015,348; beaver, \$2,461,667; mink, \$1,371,411; marten, \$1,045,810; and silver fox, \$774,348. The combined values of the pelts of these six furbearers taken during 1922-23 amounted to \$13,746,470 or 82 per cent of the total value of the fur production of Canada.

The average prices paid for the principal kinds of pelts for the season 1922-23 were generally lower than those secured in the previous season, the exceptions being marten, ermine, and red fox, prices for which were higher. The average prices for the two seasons among the principal kinds were:—

Kind.	1922-23	1921-22
Beaver..	14.04	18.38
Ermine..	.61	.52
Coyote..	10.72	9.07
Fox, cross..	43.62	50.30
Fox, red..	13.22	12.46
Fox, silver..	112.80	147.42
Fox, blue..	61.47	70.82
Fox, white..	39.09	39.70
Lynx..	19.18	20.38
Marten..	22.95	20.62
Mink..	8.59	9.00
Muskrat..	1.32	1.54
Otter..	24.32	27.26
Raccoon..	3.88	3.71
Skunk..	2.00	2.35

The number of pelts and total value by provinces in 1922-23 follows:—

Provinces.	Pelts No.	Value \$
P. E. Island..	4,881	\$ 363,252
Nova Scotia..	48,103	197,928
New Brunswick..	39,861	157,636
Quebec..	398,825	3,049,656
Ontario..	338,249	3,616,692
Manitoba..	701,091	1,673,667
Saskatchewan..	1,462,288	2,242,937
Alberta..	873,079	1,822,634
British Columbia..	263,723	1,246,219
N. W. Territories..	267,698	2,171,424
Yukon..	46,198	199,522
<b>Total..</b>	<b>4,963,996</b>	<b>\$16,761,567</b>

The first cost and the dust retarded its early popularity, but an improved grading and distributing system such as that under way will, no doubt, overcome to a certain degree these objections.

The cost of transporting coal from Swansea to Montreal is only about half that of bringing it from Pennsylvania. This is due to the very favourable ocean rates and to the large surplus of cargo space regularly coming from England to Canada. There are many factors to encourage a permanent anthracite trade development between Great Britain and Canada, which would be extremely advantageous to both countries and an unmixed blessing to the ocean carriers.

Canada produces 88 per cent of the world's asbestos supply all from the mines of southern Quebec.



## ORIGIN OF THE NAME "YELLOWHEAD PASS"

Interesting Period Recalled by Place-Names in Jasper Park Region

In the 18th Report of the Geographic Board of Canada which is now in the press, in addition to the decisions of the Board since its commencement, there is given in brief form the origin of the names ruled upon where this is known. In many cases more detailed information is in the records of the Board and can be supplied to persons interested in the meaning of any particular name.

One of the most interesting place-names is Yellowhead pass, one of the most famous of all Rocky Mountain passes.

The pass takes its name from a spot at its western entrance, where the Robson river coming south from Mount Robson joins the Fraser. Here was Tete Jaune cache, or in English, Yellowhead cache. From being applied to the cache, the name spread to the pass, the earliest name of which was the Leather pass, so called because supplies of dressed moose and caribou skins for mocassins, ropes, etc., were taken west by the fur-traders through this gateway to New Caledonia, where leather was scarce.

Tete Jaune cache was known by this name in 1827, but the first clue to the meaning of the name is in "The Northwest Passage by Land", a book published in 1865, describing the adventurous journey of two English University students (Milton and Cheadle) across Canada to the Pacific via the Yellowhead pass. The author of this book states that Tete Jaune cache was "so-called from being the spot chosen by an Iroquois trapper, known by the sobriquet of the Tete Jaune or Yellowhead, to hide the furs he obtained on the western side."

The only other printed reference to the origin of the name is in a letter to the *Montreal Gazette* in 1874 from Malcolm McLeod, whose father John McLeod was a figure of some note in the fur trade in the third decade of the nineteenth century. His diaries, letters and papers were in the possession of the son. McLeod states that Tete Jaune cache commemorates a French Canadian named Decoigne who cached his furs here. The statement reads as follows: "Tete Jaune was so called from the colour of the hair—not infrequent amongst French Canadians of Breton and Norman French origin—of an enterprising French trapper, of the name of Decoigne, who used this singularly appropriate locality—an immense hollow, but comparatively level, of some 70 square miles in area, amongst the mountains there—for his "cache" or entrepot in his line of work."

There is one person named Decoigne in fur trade annals. This is François Decoigne whom John McDonald (one of the early fur traders, called to distinguish him from others of the name "John McDonald of Garth") in his autobiography styles "a young Canadian gentleman from Berthier, M. Decoigne, a clever young man." He was employed in the fur trade in 1795 and we find him as a clerk in the Northwest Company at Fort George on the North Saskatchewan river September 18, 1798 and in the same region in 1799. In 1804 he was in the Athabaska Department. In May 1814 he was in charge of Jasper House, Brule lake, when Franchere, the first man to describe in a book the Jasper Park region, came east from the Pacific coast. Later

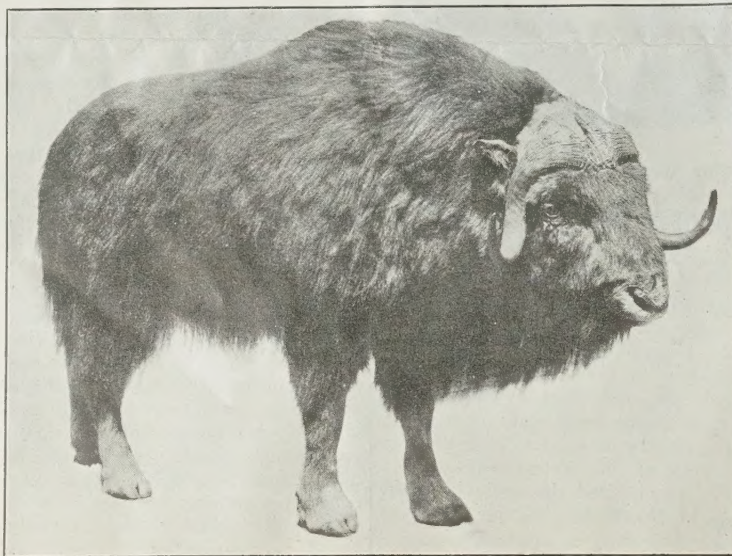
## CONSERVING CANADA'S MUSK-OX

Department of the Interior Adopts Further Protective Measures To Save Remaining Herds

Half a century ago large herds of musk-ox roamed in Canada's northern territories and even as late as twenty-five years ago good-sized herds were to be found in many localities in the Barren Lands which extend from Great Slave lake to Hudson bay and from timber-line to the Arctic ocean. In the

sion gathered much valuable information on the subject, later reporting on the situation and making a number of recommendations some of which have been embodied in subsequent regulations.

The Commissioner of the Northwest Territories, as empowered by the 1923



Conserving Canada's Musk-Ox—A full-grown specimen of this unique animal which the Department of the Interior is taking measures to preserve.

last few years, notwithstanding the protective measures adopted, these animals have become much reduced in number and in several localities where they were formerly found they have disappeared altogether. The Dominion Government, through the Department of the Interior, keeping in mind the successful effort to save the buffalo, has steadily striven to give the musk-ox such protection that they might remain a permanent asset of the country.

The musk-ox is far more than an interesting zoological specimen. It is an animal that possesses qualities which may make it of great social and economic value to the Dominion. The Government of Canada has to think not only of its wild animals but primarily of the thousands of aborigines who roam over the northland and who must be protected both from losses due to advancing settlement and from the results of their own ignorance and imprudence.

From year to year, for a good many years past, the Department has been steadily strengthening the laws and regulations to protect these animals. In 1917 the Northwest Game Act was passed and by one of its clauses no persons except Indians, Eskimos, and half-breeds were allowed to kill musk-ox, and killing by these people was permitted only when they were in actual need of food. No person was permitted to trade in the pelt or any other part of the musk-ox. In 1919 there was appointed the Royal Commission on the Reindeer and Musk-Ox to investigate the possibilities of establishing musk-ox and reindeer industries in the Arctic and sub-Arctic regions. The Commis-

Decoigne transferred to the Hudson's Bay Company but continued to operate in the same district, namely the Athabaska.

amendments to the Northwest Game Act, on 10th March, 1924, issued a regulation prohibiting the use of dogs in the hunting and taking of game animals in the Northwest Territories. The significance of this regulation will be the more readily seen by those conversant with the habits of the musk-ox. It is a primal instinct of musk-ox to flee from man but to stand and form a circle when attacked by wolves or dogs. Native hunters have taken advantage of this fact to send on their dogs first and since they have acquired modern firearms, which are effective at a very much greater range than their old bows and arrows, they have been able to kill the musk-ox in much greater numbers.

Reports of the continued wanton and unnecessary slaughter of the musk-ox by natives, which rumours were corroborated by missionaries and other responsible persons, necessitated the passing of an Order in Council on 8th April, 1924, prohibiting any person whatsoever from hunting or killing musk-ox at any time of the year. The order also prohibits any person from trafficking in these animals.

In order to ascertain whether a special musk-ox patrol would be advisable to reach districts not now covered by the Royal Canadian Mounted Police, a special investigator has been appointed. This officer, who speaks the language of the natives, will while pursuing his investigations, disseminate propaganda on the necessity for the conservation of the musk-ox and other wild life.

The number of pure-bred horses in Canada increased 44 per cent from 1911 to 1921 according to the figures of the Dominion Bureau of Statistics. The 1921 census showed 3,610,500 horses in the Dominion of which 47,782 or slightly more than 13 in every 1,000 were pure-bred.

## INCREASE IN DAIRY EXPORTS DURING 1923

Gains Recorded in Quantities and Values—Great Britain a Good Customer

Exports of dairy products from Canada during 1923 showed an increase in aggregate value of \$2,532,374 according to figures issued by the Department of Agriculture. This substantial gain was largely due to the increase in the quantity and value of cream and milk exported. There was a considerable decrease in the amount of butter shipped out of the Dominion, and although a slight drop occurred in the quantity of cheese exported, the total value showed a gain. There were large increases in milk powder and condensed milk exports over 1922.

During the calendar year 1923, Great Britain took 4,365,597 pounds of butter, 110,513,200 pounds of cheese, 50,421 pounds of milk powder, and 12,590,100 pounds of condensed milk, to the total value of \$25,101,547.

The following comparative table gives the quantity and value of exports of dairy products during 1922 and 1923:—

	1923	1922
Cream.. .. .gals.	2,668,747	1,845,325
Value.. .. .	\$ 4,451,582	2,832,215
Milk.. .. .gals.	2,132,765	878,584
Value.. .. .	\$ 437,215	192,510
Butter.. .. .lb.	13,173,711	21,504,808
Value.. .. .	\$ 4,905,608	8,015,395
Cheese.. .. .lb.	116,201,900	120,177,200
Value.. .. .	\$ 23,445,401	21,636,739
Casein.. .. .lb.	8,910	20,049
Value.. .. .	\$ 895	1,276
Milk powder.. .. .lb.	4,975,838	3,452,435
Value.. .. .	\$ 475,419	332,406
Condensed milk.. .. .lb.	41,092,200	24,812,800
Value.. .. .	\$ 4,628,979	2,802,184

Total value of dairy products exported during 1923, \$28,345,009 as compared with \$25,812,725 for 1922.

\* Prepared from material supplied by the Dairy and Cold Storage Division, Department of Agriculture, Canada.

### UNOFFICIAL BIRD-BANDS

The Canadian National Parks Branch, of the Department of the Interior, which is keeping the file of Canadian Bird Banding Records, has recently received a band of a kind differing from the official bird-bands used in Canada and the United States, and an endeavour is being made to trace its origin. It is made of aluminium and has the number "57" stamped on it. Mr. Arthur Shuttleworth, of Plummer, Ontario, found the band on a young teal duck which he shot on Cariboo lake, district of Algoma, Ontario, on September 12, 1923. The band will be lent to responsible persons who consider that they may be able to furnish information concerning it. Application should be made to the Commissioner, Canadian National Parks, Ottawa.

### DESTROYING PREDATORY FISH

The destruction of nearly 28,000 coarse fish, principally squawfish, by the staff of the Cultus Lake Hatchery, B.C., is announced by the Department of Marine and Fisheries. This work was undertaken as a result of the investigations that were made when the sockeye yearlings were migrating from Cultus lake to the sea. It was noticed that the squawfish were feeding on the young salmon and an examination of the stomachs of a number of those caught gave an average of three yearling salmon to each squawfish.

The Kootenays, British Columbia, are the principal source of zinc in Canada. There are workable deposits at Notre Dame des Anges, and in the Gaspé peninsula, Quebec.



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## FORT WELLINGTON WAS IMPORTANT MILITARY CENTRE

A RELIC OF EARLY CANADIAN HISTORY

Department of the Interior Completes  
Restoration of Historic Blockhouse  
at Prescott, Ontario

On the recommendation of the Historic Sites and Monuments Board of Canada restoration work on Fort Wellington, Prescott, Ontario, has been undertaken and completed by the Canadian National Parks Branch of the Department of the Interior. It is the intention of the branch now to erect a bronze tablet bearing record of the salient facts in the history of the fort. The old fort is connected with the stirring and romantic events of the war of 1812, and especially with the capture of Ogdensburg by Colonel MacDonell and his Glengarry men. It was constructed in 1812-13, under the direction of Lieut.-Cols. Thomas Pearson and George R. J. MacDonell, as the main base for the defence of the communication between Kingston and Montreal, and named Fort Wellington in honour of the victory gained at Salamanca by the British under Wellington, July 22, 1812. It was here that MacDonell assembled the forces which took Ogdensburg on February 22, 1813, and here also, that Col. Young gathered the troops for the defence at the Windmill, November 11-13, 1838.

Upon the declaration of war by the United States in June, 1812, the small unfortified village of Prescott, then consisting of about thirty houses, became at once a position of considerable military importance. It was the head of boat navigation upon the St. Lawrence and the starting point of ship navigation on lake Ontario. All military stores and the major part of other supplies for the garrisons in Upper Canada had to be conveyed from Montreal either by water carriage or by wagons or sleighs by the single passable road, closely following the north bank of the river, and, in many places, under direct hostile observation from the opposite shore. The expulsion of the American garrison on the St. Lawrence secured the line of communication from immediate danger and interruption.

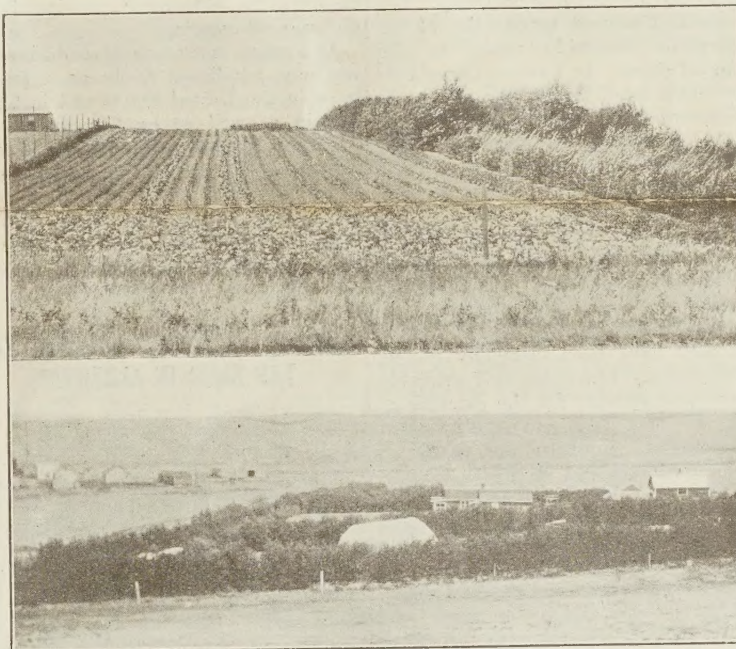
When the immediate trouble was over, work was continued upon Fort Wellington and it was made a place of considerable strength. It continued to be a military post, occupied by a small garrison of regular soldiers until the

(Continued on page 3)

## SHELTER-BELTS ON THE PRAIRIES

Many Thousand Farm Homes Now Surrounded by Trees—  
Added Comfort and Productivity

The vital work of protecting Canada's at Indian Head and Sutherland, Saskatchewan, and the devising of systems of vision and advice as to planting. The cutting to insure harvests of timber settler on his part supplies the labour from those areas in perpetuity has to a certain extent overshadowed the work which the Department of the Interior has also done in placing groves and purpose is served by these groves and



Shelter-belts on the Prairies—Both pictures were taken on farms in Saskatchewan. The lower picture shows how much beauty and comfort has been added to a homestead by a belt of only five seasons' growth. The contrast between the two homesteads in the picture is striking. The upper picture shows how fine a garden the farmer has been able to make in the shelter of his young hedge.

shelter-belts on the rich agricultural lands of the prairies where no trees had grown in the memory of man. The former is the greater task but every year increases the importance of the latter. Begun in a small way at a time when it was generally believed that trees could not be made to grow on the prairies, the work has been so eminently practical that it is now proceeding, by the desire of the people of the prairies, at an accelerated pace. Furthermore, the co-operative plan of tree distribution employed by the Department of the Interior has been adopted, modified to suit conditions, by several of the provinces and certain United States departments.

Under this co-operative plan the Forestry Branch of the Department of the Interior supplies the seedling trees and cuttings from its forest nursery stations

belts of trees, and the answer is that not only do they increase the amount and variety of agricultural and horticultural products, both by conserving moisture and by stopping soil drifting, but also by their beauty and by the added comfort they bring, they deepen the content of life for all dwellers on the prairies.

The annual distribution of seedlings and cuttings for shelter-belt planting on the prairie farms of Manitoba, Saskatchewan and Alberta was completed about the middle of May. A total of 5,215,800 seedlings and cuttings was sent out to 4,593 individual planters. This season there are six hundred more applicants on the list of those desiring to set out shelter-belts than last summer.

The distribution of planting material has now been carried on for 23 years

(Continued on page 3)

## LARGEST KNOWN DEPOSIT OF TAR SAND IN ALBERTA\*

McMURRAY THE CENTRE  
OF OUTCROPPINGS

Many Possible Economic Uses For the  
Material—Successful Experiment  
in Paving

An extensive deposit of bituminous sand outcrops at frequent intervals along the Athabaska river and certain of its tributaries in the district centering about McMurray in northern Alberta. The area represented by outcrops, and presumably underlain by bituminous sand, extends for 35 to 40 miles east and west, and 100 miles north and south, between W. long. 111° and 112° 15' and N. lat. 56° 15' and 58°. Upwards of 250 exposures, all within 60 miles of McMurray, and representing parts of one continuous deposit, have been examined and measured. Certain of these outcrops represent portions of a deposit that, under reasonably favourable market and transportation conditions, may eventually prove commercially valuable; but only a limited portion of the area can be considered to be of present economic value, if such controlling factors as thickness and character of overburden, transportation, percentage of associated bitumen, and uniformity of material are considered. Each of these factors, as well as labour, fuel and water supply should be given careful and detailed study in considering commercial development in the McMurray district.

Associated with the bituminous sand are occasional small seepages of bitumen, locally known as tar springs. These originate in the richer beds, but are not considered to be of economic importance.

It may be stated that the McMurray deposit represents the largest known occurrence of solid asphaltic material, and that it is as yet totally undeveloped. Practically all asphaltic materials and petroleum products used in Canada are now imported from foreign countries.

Three possible lines along which the bituminous sand may be commercially developed, are suggested:

(1) The crude material may be used for the surfacing of streets and high-

\*Prepared under the direction of Dr. Charles Camsell, Deputy Minister of Mines, Canada, by Mr. S. C. Ellis, Ottawa.

(Continued on page 2)



## SURVEYS AID MINERS IN OPENING NEW AREA

Department of the Interior Extends Control  
Surveys Into Northern Manitoba

In accordance with the usual method of the Department of the Interior of extending surveys for control purposes when the necessity arises into districts removed from settlement, the Topographical Survey of Canada last summer sent one of their survey parties into the Herb Lake district of northern Manitoba with instructions to make control



surveys of the principal lakes and rivers in that vicinity where mineral claims had been staked. This method of projecting control surveys into previously unsurveyed territory is in pursuance of the policy of economy of the Department in carrying on its work. These surveys form a most ready means for tying in, for proper registration purposes, mineral claims as they are staked, thus avoiding possible confusion. In view of the reports from The Pas of an estimated influx of over 5,000 prospectors and others into the Herb Lake section this year, the necessity of making these surveys is at once apparent.

In spite of the usual difficulties encountered on work in such outlying districts, the survey party completed no less than 2,000 miles of control traverse of the main waterways, erecting permanent monuments every few miles as reference points for tying in all mineral claims, settlements, and so on. These waterways extended from Athapapaskow lake northerly to Churchill river, along Churchill river from the western border of Manitoba easterly for 140 miles to Nelson lake, and along Burntwood and File rivers with their numerous lakes and portages to Reed lake.

Certain definite points in the traverse were also established for ground control purposes for aeroplane photographs which were later in the season taken by members of the Topographical Survey, in co-operation with the Royal Air Force of Canada. The detailed maps of the area now being prepared from the combined ground and aerial surveys will prove invaluable in the future mineral development of this section of the country.

## CANADA'S RESOURCES IN WOOL\*

Abundance of Sheep Lands—High Quality of Our Wools—  
Flocks Increasing

The sheep industry in Canada made considerable expansion during the war years. There was some decrease during the years 1921, 1922 and 1923, but the good prices which were maintained for lambs and the upward trend in wool prices has again stabilized the industry and the present tendency is to increase rather than decrease the size of flocks.

The estimated wool production of the Dominion for 1923 was 15,539,416 pounds. Of this amount from 10,000,000 to 12,000,000 pounds passes through the regular trade channels and is sold either to Canadian mills or is exported. The balance of the wool clip is worked up locally by farmers' wives, being spun into yarn for socks, mitts, underwear, sweaters and other articles of apparel.

The sheep resources of Canada are more or less unlimited in that there is abundance of waste lands in most of the provinces admirably suited for sheep raising. Furthermore, there are many farms, particularly in Western Canada, that as yet are carrying no sheep. The climate and natural topography of the country is admirably suited to the raising of sheep. In Eastern Canada on mixed farm lands and in the grain belt of Western Canada, the small flock of ten to fifty ewes is generally kept. These flocks can be maintained at little expense and return an excellent revenue for the labour required and money invested. In the rougher part of Eastern Canada and in some districts of Manitoba larger flocks of from one to several hundred head are kept under semi-ranching conditions often by new settlers who may have been originally miners or fishermen. There are still available many areas suitable for the carrying of flocks of this size. In southwestern Saskatchewan, southern and parts of northern Alberta and in British Columbia sheep ranching is practised quite extensively, but even in these provinces there are tracts of land available for ranching or semi-ranching purposes.

Wool produced from Canadian sheep, both in the east and in the west, is of a very high quality for each respective grade. Eastern wools are all produced from the domestic breeds of sheep. They are very strong of fibre and bright in character. The bulk of eastern wools grade medium combing and low medium combing with some fine medium combing and considerable quantities of low combing and coarse. Eastern domestic wools have excellent felting qualities and are well adapted for the manufacture of medium and heavy weight goods, including serges and tweeds, rugs, blankets, sweaters and underwear.

In Western Canada the percentage of domestic wools is steadily increasing. There is also a probability that the amount of range wools will be increased considerably in the next five years. Western domestic wools are of much the same quality as eastern wools although they probably run more to the

finer grades. The nature of the soil and the openness of the country tends to the production of a heavier shrinking wool. Soil-drifting also detracts from the brightness of the fleece and on this account grades of western wool are subdivided into bright, semi-bright and dark. Wool produced from Western Canada range sheep compares favourably with wool produced on other range areas of the world. The bulk of the range wools run to the fine, fine medium combing, and medium combing grades.

Wool grading, which was first instituted by the Dominion Live Stock Branch in 1913, has done much to improve the market qualities of Canadian wool. About twelve thousand sheep raisers now consign their wool for grading and co-operative sale. This constitutes about one-quarter of the sheep raisers. The growers have their own marketing agency, the Canadian Co-operative Wool Growers, Ltd. This organization is an affiliation of some thirty wool-growers' associations and handles all the co-operative shipments consigned for government grading.

As a result of grading, Canadian wools are now purchased freely on a graded basis in the United States and in Great Britain as well as by Canadian mills. The more general use of pure-bred rams is steadily increasing the percentage of the higher grades and, having in mind the present strong demand for breeding ewes, it is confidently expected that wool production will materially increase during the next few years.

### LARGEST KNOWN DEPOSIT OF TAR SAND IN ALBERTA\*

(Continued from page 1)

ways. In 1915, in order to demonstrate the merits of the material, the writer designed and laid in Edmonton, Alberta, areas of standard sheet asphalt, bitulithic and bituminous concrete. This effort marked the first attempt to commercially utilize the bituminous sand as a paving material, and the result was entirely successful. The extent to which the crude material may be used for such purposes will be largely determined by freight charges.

(2) The bitumen, which is of a high grade, might be separated from the sand aggregate, and utilized for a number of recognized purposes for which such material is well adapted.

(3) The crude bituminous sand might be retorted for the recovery of crude petroleum. Such a distillation has been made, using a retort with a charged capacity of 25 pounds crude bituminous sand, and the crude petroleum was fractionally distilled and the various distillates refined. The possibilities of such distillation on a commercial scale have not been determined, but there are strong indications that the associated hydrocarbons can be successfully recovered from the bituminous sand in this manner.

Field work in the McMurray district has included the measurement of practically all outcrops, and extensive core sampling throughout a large part of the area. As a result of this work, it is now possible to indicate a number of

## GROWTH OF MILLING INDUSTRY IN CANADA

Rapid Expansion in Keeping With Dominion's  
Position Among Wheat Producers  
of World

From its humble beginning at Port Royal (now Annapolis Royal, Nova Scotia) in 1605, flour and grist milling in Canada has grown to be one of the Dominion's most important industries. According to an early census there were nine mills in operation in New France in 1665 while the latest figures (those for 1922) compiled by the Dominion Bureau of Statistics show 1,364 operating mills in Canada with a daily capacity of 134,125 barrels. The amount of wheat milled and flour produced by these mills showed a considerable increase during 1922. This year saw 81,413,649 bushels of grain converted into flour, as compared with 70,005,373 bushels in 1921 and 61,116,380 bushels in 1920. The production of flour during the 1922 calendar year reached 17,787,929 barrels, an increase of 2,466,170 barrels over the previous year and 4,660,609 barrels greater than 1920.

Easy access to the Atlantic seaboard has heretofore been a determining factor in deciding the location of flour and grist mills in Canada. Of the 1,364 mills in operation in 1922, 1,211 were situated in Ontario, Quebec, and the Maritime Provinces. In the early days of the industry Montreal became the centre of flour and grist milling and it has held its predominant position, the daily output of the mills in its vicinity totalling nearly 20,000 barrels in 1922. However, with the development of the Pacific trade the growth of western points as milling centres is being accelerated, and there is every indication that the industry will continue to expand in proportion to the Dominion's position as one of the great wheat-producing countries of the world.

areas which, on the basis of observed outcrops, appear to be adapted to possible commercial development. Detailed topographical maps of a large part of the area are being prepared for publication.

At the present time the problem presented by the recovery of hydrocarbons from the crude bituminous sand is being studied by a number of responsible individuals and companies.

### DISTRIBUTION OF PICKEREL FRY

Over One Hundred and Sixty Million Planted  
Out By Federal Hatcheries

Over one hundred and sixty million pickerel fry have been distributed from the fish hatcheries operated by the Department of Marine and Fisheries in Ontario, Manitoba, and Saskatchewan this season. The number planted out by each of the hatcheries is given in the following table:—

Thurlow, Ont. . . . .	54,300,000
Sarnia, Ont. . . . .	27,000,000
Collingwood, Ont. . . . .	6,760,000
Kenora, Ont. . . . .	58,980,000
Gull Harbour, Man. . . . .	11,220,000
Fort Qu'Appelle, Sask. . . . .	2,365,000
Total . . . . .	160,625,000

\*Prepared under the direction of Dr. J. H. Grisdale, Deputy Minister of Agriculture, by Mr. A. A. McMillan, Chief of the Sheep and Goat Division, Live Stock Branch.



# NATURAL RESOURCES CANADA

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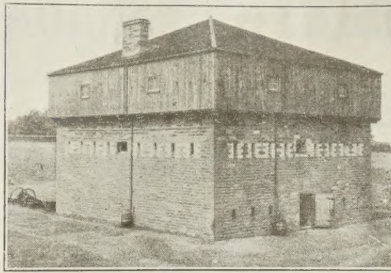
## SHELTER-BELTS ON THE PRAIRIES

(Continued from page 1)

and from a very small beginning in 1901 covering applications from only some twenty farmers it has increased to the present proportions, clearly indicating the general demand for assistance in this respect. The results from this policy of free distribution have been very successful. This is at once apparent from the increased demand. If any large percentage of failures occurred in the plantations it would be an utter impossibility to induce practical farmers to spend time and labour on tree planting. Actual inspection reports from officers of the Tree Planting Division show that fully 85 per cent of the belts set out under this plan are ultimately successful. The results of this tree planting campaign are evident to any one who was familiar with the conditions in the West twenty years ago. Attractive farm houses can be found in every district and in the older settled parts a farm without some attempt at tree planting is getting to be rather the exception.

Not so many years ago fruit growing as a practical undertaking was never considered as possible, but now we find farmers all over the country growing small fruits, plums and crabapples and in some cases even standard apples, in quantities sufficient for all home requirements. This has been largely made possible by the development of shelter-belts established through the assistance of the Government. The possibilities in prairie fruit growing are very promising. At present the demand for hardy fruits greatly exceeds the available supply and there are great opportunities for those engaged in the commercial nursery industries in catering to this rapidly increasing need for really hardy-prairie-grown fruit trees and ornamental shrubs.

The natural conditions peculiar to the West in respect to the absence of tree growth in the most desirable farming areas and the difficulties of growing trees under these conditions, especially for those with little experience in the country and no previous knowledge of tree planting, warrants every encouragement possible in this line of development on the part of the Government.



Historic Fort Wellington—The picturesque block-house forming part of the old fortifications in the town of Prescott, Ont.

## FORT WELLINGTON WAS IMPORTANT MILITARY CENTRE

(Continued from page 1)

autumn of 1837 when all troops were withdrawn to Lower Canada to restore order there. In 1838 the fort again became the scene of activity and Col. Young was sent there with a small garrison to occupy it, though it had fallen into considerable disrepair. Repairs were executed subsequently and in 1866 the fort was used in connection with the Fenian raids. It was also occupied in 1885, at the time of the Northwest Rebellion.

The site of the fort covers an area of 8½ acres on which there is a blockhouse, officers' quarters, caretaker's dwelling and other buildings. The fort is surrounded by a moat with palisades and ramparts on which are two old guns. One of the most interesting of the buildings is a listening post, reached by an underground passage. The blockhouse has three storeys, the first two built of stone and brick and the third of wood, as will be seen in the accompanying illustration.

The distribution of planting material is limited almost entirely to supplying small seedlings and cuttings for establishing really practical shelter-belts on actual farm property. As the Department has no desire to curtail the field of any legitimate commercial enterprise no attempt is made to supply fruit trees or ornamental stock of any nature and no material of any kind is furnished to those living in towns or cities. Under present conditions it is most desirable to stimulate the planting of large blocks of trees in the agricultural areas and experience has shown that the only way to achieve these records is to supply the young stock, as very few farmers are in a position to spare the money that would be required to purchase plants in sufficient quantity to establish a really efficient shelter-belt.

During the past few years a very serious menace to agriculture has arisen in the increase of soil-drifting over large areas of the most productive agricultural regions of the prairies. Farmers, municipalities, and agricultural associations are turning to shelter-belt planting as the most hopeful remedy for this serious economic problem. Thus the work of the Forestry Branch of the Department of the Interior enters a new phase in meeting a very real need in conserving the property of the agricultural population on the western prairies.

Canada possesses the only commercial source of helium in the British Empire. Alberta natural gas contains 0.3 per cent. Development of aviation should render this extremely valuable as a non-inflammable gas for dirigibles.

## OPENING UP OUR SCENIC RESOURCES TO MOTOR TRAVEL

### EXTENT OF THE NATIONAL PARKS HIGHWAYS

#### Growing Interest of Canadians in Grandeur and Beauty of Their Playgrounds

During recent years there has been a noticeable increase in the interest shown by Canadians in the beauty of their own country and the potentialities latent in its great natural scenic resources. The motor car, which has revolutionized modern modes of travel, is taking people into the open and giving them opportunities to see the wonders of nature such as they never before had, and in this way our citizens, in growing numbers, are beginning to realize the extent of the nation's wealth of scenery and especially to appreciate the rich possibilities for enjoyment and recreation offered by the Canadian National Parks. The construction and maintenance of good motor roads is in keeping with the demands of the age and of the ever-increasing army of motor tourists, the members of which go their way bringing benefits to themselves and to the communities they visit.

A good part at least of the steady growth in the number of visitors to the parks must be attributed to motor travel. Last year 8,000 cars entered Banff National Park, the majority of which were owned by Canadians. Many of these visitors come with tents and camping equipment and spend their entire holiday in the park. The use that is being made of the parks in this way is a thoroughly democratic one and in keeping with the ideals behind their creation. For while no one can travel through the Canadian Rockies or spend even a few hours among the wonders of the National Parks without gaining a new conception of the greatness and beauty of Canada and of the possibilities of national life, still the mountains yield their real riches only to those who come and live among them, absorbing through weeks their silent strength and peaceful serenity. These are benefits the parks were created to give and they cannot be gained by the visitor who rushes through them in a few hours either by railway train or motor car.

The extension of good roads in the parks has done much to bring the visitor into closer touch with those points of greatest scenic attraction and the erection of tea-houses, camps, and other conveniences along the principal highways has contributed to the enjoyment of the visit. The great advantage of motor over railway travel is that it permits the traveller to take his time. He may start when he will and stop where he pleases and there will be no time-table to regulate his proceedings.

In order that the extent of the highways constructed and maintained by the Canadian National Parks Branch of the Department of the Interior may be the better realized a few comparisons with prominent highways will be of interest. The total length of the motor roads in use in the parks is a little over 330 miles, a mileage nearly as great as that of the famous Columbia River highway in the state of Oregon, and practically the same as that of

## WHEAT EXPORTS INCREASE

### Greatest Improvement Shown in Shipments Direct from Canadian Seaports

Over two hundred and sixty-four million bushels of wheat were exported from Canadian seaports and inland ports during the ten months ended June 30, 1924, according to a recent statement of the Dominion Bureau of Statistics. Exports through all channels show considerable improvement over 1922 and 1923 figures, but by far the greatest increase is in the exports to overseas countries from Canadian seaports.

#### Quantity of Canadian Wheat Exported from Canada

Ports of Exit	1924 (Bushels)
To United States via all ports . . . . .	20,701,373
To Overseas Countries via Canadian seaports—	
Halifax, N.S. . . . .	240
Montreal, Que. . . . .	47,262,196
Quebec, Que. . . . .	2,144,208
St. John, N.B. . . . .	9,412,231
Vancouver, B.C. . . . .	50,691,096
Total . . . . .	109,509,971
To Overseas Countries via United States—	
Bridgeburg, Ont. . . . .	223,569
Coaticook, Que. . . . .	7,977,292
Fort William, Ont. . . . .	75,099,905
Niagara Falls, Ont. . . . .	276,942
Port Arthur, Ont. . . . .	48,269,934
Prescott, Ont. . . . .	111,552
Other Canadian Inland Ports . . . . .	2,700,542
Total . . . . .	134,659,736
Grand total . . . . .	264,871,080

the road between Montreal and Toronto. Banff National Park, the oldest and best known of the parks, contains 130 miles of motor road, including a greater part of the Banff-Windermere highway. Sixty-two miles of the Banff-Windermere road extends through Kootenay National Park; Jasper Park contains 39 miles of motor road, including the completed portion of the new Edith Cavell highway; Waterton Lakes and Yoho Parks each have 33½ miles of good roads; and the remaining 35 miles of the total is divided among Mount Revelstoke, Glacier, Point Pelee, Elk Island, and Buffalo National Parks.

During the present season the construction of new roads is being confined almost entirely to Jasper Park, although maintenance work is being continued on all the other park roads. The Edith Cavell highway, which has been constructed to within five and two-third miles of the base of Mount Edith Cavell, will be completed this year but will not be open for traffic until next season. This road gives access to one of the most impressive scenic regions in Jasper Park and will bring visitors to the base of this famous mountain memorial, with its solemn Ghost glacier. Work on the Jasper highway is being continued on the fifteen-mile stretch from the town of Jasper to Pocatontas, which is the starting point for the well known Miette hot springs. Clearing on the proposed motor road from Laggan in Banff National Park to Field in Yoho Park is also being carried forward this year.



## CANADA HAS IMMENSE RESOURCES IN COAL\*

Surveys Indicate That Possibility of Exhaustion of Supplies Is Remote

Attention was directed during recent scientific gatherings in England to the possibility that the coal resources of the British Empire may be exhausted within a few centuries. So far as Canada is concerned such a contingency seems to be remote. For many years the Canadian Geological Survey has been investigating the coal fields of the Dominion and it has been estimated that the reserve of coal amounts to more than 1,000,000,000 tons largely lignite, but including over 250,000,000 tons of bituminous coals. Though the greater part of the various coal fields has been studied in a general way, yet their extent is so great that detailed investigations by the Geological Survey have been limited to a relatively small part of the whole. The great extent of the Canadian coal fields is apparent when it is realized that basins of coal-bearing strata extend almost continuously for a length of 700 miles within the eastern part of the Rocky mountains and adjoining foothills. The coals of this region are largely bituminous or semi-anthracite and seams ten to fifteen feet in thickness are common. In addition, thousands of square miles of the prairie country of Alberta, Saskatchewan and Manitoba are underlain by strata holding workable seams of lignite and bituminous coals, and important coal fields occur in British Columbia both in the interior and on the Pacific coast while highly developed coal fields occur in the east in Nova Scotia and New Brunswick, in some cases at tide water.

\*Prepared under the direction of Dr. Charles Camsell, Deputy Minister of Mines, by Dr. G. A. Young, Geological Survey, Canada.

## SPECKLED TROUT IN MARITIME PROVINCES

The fish cultural operations carried on by the Department of Marine and Fisheries have been almost entirely in the interests of the most valuable commercial food fishes. The demand for speckled trout has, however, increased in recent years in the Maritime Provinces, and with a view to meeting this demand, 700,000 speckled trout eggs were obtained early in the year from the state of New Hampshire and 1,200,000 have been secured from commercial fish farms in the United States. These eggs have been distributed amongst the various hatcheries in the Maritime Provinces.

## MOUNT JACQUES CARTIER

With the exception of the Torngats in Labrador, peaks of which exceed 6,000 feet in height, the highest mountain in Canada east of the Rockies is Tabletop mountain in Gaspé district, Quebec, the summit of which is 4,350 feet. The Geographic Board has just approved the name Mt. Jacques Cartier for this peak in commemoration of the explorer who was the first to see the region in which the mountain occurs, having followed the Gaspé coast all the way around from the mouth of the Restigouche river.

## THE LOBSTER INDUSTRY IN CANADA

Takes Important Place in Fisheries of Maritime Provinces—Dominion Government's Protective Measures

Lobstering is one of the chief industries connected with the fisheries of the Maritime Provinces and each year millions of dollars' worth of these table delicacies are taken from the traps of fishermen in the Gulf of St. Lawrence and along Canada's Atlantic seaboard. During the season of 1923 lobsters caught by the fishermen of the

1922. Ice remained on the shores until the middle of May but after that fine weather prevailed and operations were carried on successfully, resulting in an increased catch. Ten more canneries were operated during 1923 than in the previous year, the total being 195.

In the province of Quebec the lobster industry does not hold the same posi-



Lobster Fishing in the Maritime Provinces—Hauling in the traps on a calm morning. Note the modern power-boat.

provinces of Prince Edward Island, Nova Scotia, New Brunswick, and Quebec yielded a revenue of \$6,365,362 according to returns made to the Department of Marine and Fisheries. This was a slight increase in value over the 1922 season brought about by the higher prices secured. In Prince Edward Island and in New Brunswick there were increases in both the quantity and value of the catches, but in Nova Scotia adverse weather conditions caused a decrease in the quantity of lobsters taken, but the higher prices obtained over the previous season caused a rise in the total value.

The total catch of lobsters in Nova Scotia last year was 172,720 cwt., valued at \$3,081,647, as compared with 173,706 cwt., in 1922, with a value of \$2,913,087. The fishing in western Nova Scotia, which opened on March 1, was carried on under abnormal conditions. Ice was piled along the shore until late in the spring, making remunerative operations impossible. The catch for the months of March and April amounted to not more than 12,511 cwt. as against 26,266 cwt. in 1922 and 66,326 cwt. in 1921. With a month's extension of the fishing season, however, the total catch about equalled that of the 1922 season. There were 163 canneries in operation during the year, being six more than in 1922.

The catch for the whole of the province of New Brunswick during 1923 amounted to 73,668 cwt., an increase of nearly 4,000 cwt. over 1922. The value of last season's production was \$1,339,155, and of the previous year, \$1,262,714. The harvest reaped in the Gulf sections was greater than that of the preceding season by about 5,000 cwt., but in the Bay of Fundy sections there was a falling off of about 1,300 cwt. Canning was carried on by 167 establishments, an increase of six over the previous year.

The lobster fishery is the most important of the fisheries of Prince Edward Island and the value of the 1923 production, \$1,405,906, represented about 80 per cent of the total value of the year's fishing operations. The lobster catch amounted to 97,456 cwt. last season as compared with 87,583 cwt. in

tion of importance that it does in the Maritime Provinces. Last year the Quebec fisheries produced 37,764 cwt. of lobsters, valued at \$538,654.

The Department of Marine and Fisheries has, on account of the importance of this industry, always given the greatest consideration to its preservation. In order to prevent poaching and to keep an effective control on the fishery at all times, a large staff of officers is maintained on the coast and no one may fish for lobsters without first obtaining a license. The possibility of having a license cancelled ensures the careful observance of the regulations. The other chief means used for the preservation of the industry has been the adoption of close seasons and the Department is making a thorough study of this part of the subject to ensure that the seasons adopted are the best possible for all concerned.

## CURRENT REPORTS

**Timber Trees.**—A new series of short circulars regarding the forest trees of Canada is being issued by the Forestry Branch of the Department of the Interior. These are designed to treat the different important timber trees, each in a separate pamphlet of some six or eight pages, with illustrations showing the general form of the tree, the foliage (leaves or needles), and the fruit (nuts, cones, etc.). The White Pine is the subject of No. 1 of the series, No. 2 similarly treating of the White Spruce. These are now available in both English and French. Nos. 3 (Douglas Fir) and 4 (Hemlock) are now available in English, and will shortly appear in French.

Copies may be had upon application to the Director of Forestry, Department of the Interior, Ottawa.

**Canada's Wild Buffalo.**—This pamphlet describes briefly the range of the last wild buffalo herd, which range extends from the district west and south of the settlement of Fort Smith in the North West Territories into northern Alberta; compares the herds inhabiting

## POWER DEVELOPMENT AND ITS APPLICATION

The Latter Requires By Far The Greater Amount of Capital and Labour

The distinction between water-power development and its application, that is in investment, employment, and wages is not generally realized, important as it is to a country like Canada which possesses such large resources in water-power. Development covers building of the power plant, transmission of the energy, and its distribution in cities and towns. Application involves the installation of wiring and appliances in houses and buildings, the building and electrical equipment of factories, mines and other industries and many miscellaneous uses.

A special study of the ultimate investment made and employment furnished was recently made in the United States by a census of actual undertakings and districts. It was assumed that there is gradually extending development and that the employment is that for operation of the plant, factories, etc., not that for construction of the power plant. The results may be summarized thus:—

Per 1,000 H.P.

Total investment, \$1,861,000; total number of employees, 385.

	Investment	Development	Application
Investment . . .	\$250,000	\$1,611,000	
Per cent of total	13.4	86.6	
Employees . . .	8.6	376.4	
Per cent of total	2.2	97.8	

It will be seen that the investment and employment due to the development itself, which is all that is usually considered, is but a trifle compared with the investment and employment due to the application of the power when produced and distributed.

this region, which number about 1,500, with other members of the bison family; and outlines the dangers threatening the herd and the measures being taken for the protection of these characteristic Canadian animals.

Copies of this pamphlet may be secured on application to the Director, North West Territories and Yukon Branch, Department of the Interior, Ottawa.

**Facts About Peat.**—In this bulletin of 48 pages, written in non-technical language, the outstanding facts in relation to the peat deposits of Canada and their possibilities as a source of fuel to replace anthracite in the domestic market are discussed. The bulletin deals with the nature of peat, the difficulties involved in its production and the underlying principles upon which any successful attempt at manufacturing must be based. The Air-Dried Machine Peat process, the only process which has so far been employed successfully on a large scale is described, and the character and value of the fuel manufactured according to this process are discussed.

Copies of this bulletin, Mines Branch Report No. 614, may be obtained on application to the Director, Mines Branch, Department of Mines, Ottawa.

The total area planted to potatoes in Canada during 1923 was 624,069 acres and the estimated yield was 52,554,000 centals. The final estimate of the 1922 crop was 55,745,000 centals. Quebec led production in 1923 with a yield of 18,768,000 centals.



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## C.G.S. "ARCTIC" RETURNS FROM ANNUAL NORTHERN PATROL

### Exploratory and Administrative Work Carried Out During Adventurous Cruise Among Canada's Arctic Islands

were again in working order and she was able to proceed.

On July 22 Blacklead island and Cumberland sound were reached and Inspector C. E. Wilcox of the Royal Canadian Mounted Police was taken on board. He remained with the ship for the rest of the voyage inspecting the posts visited. At Pangnirtung on the 24th, one of the ship's party, Mr. J. D. Soper, of the Geological Survey, went ashore to remain there to conduct exploratory work in the southern part of Baffin island until the ship calls next year. A very poor year for furs was reported by the Hudson's Bay Company's agent at this post. He said, however, that an unusual amount of whale oil had been taken, one drive netting over 800 whales (*Delphinus Leucas*).

The next point of call was at Godhavn, Greenland where a welcome was extended by Herr Lindow, Governor of North Greenland. The call at Godhavn, now an annual affair, is always interesting for there it can be learned what the Danes have been able to do for the natives in 150 years of supervision. Here a quantity of local coal was taken on to replace that thrown overboard in the storm. Ponds Inlet was reached on August 5.

At Craig Harbour, the next point of call, three members of the Royal Cana-

dian Mounted Police and two Eskimo families who had spent the year there were found in good health. They reported, however, that in February last, while the thermometer registered 55° below zero, the main building of the post had been burned to the ground. Since then the police had been forced to live in a small building that formerly had been used as a blubber house.

Still sailing northward the expedition touched at Etah, Greenland, and then crossing Smith sound skirted cape Sabine and the south shore of Pim island searching for a suitable site for a post. In 1923 these shores had been completely blocked with ice and quite inaccessible. A building was finally erected on the west shore of Rice strait near Kane basin and called Kane Basin Detachment. It is the intention of the police at Craig Harbour to make a patrol to this point during the winter, a distance of over 200 miles. From Kane Basin Detachment, which is in Lat. 78° 46' N., about 2,300 miles due north of Ottawa, the expedition turned southward on August 12, and on August 14 was again at Craig Harbour.

The next point of call was Dundas Harbour, Devon island, where a site for a post had been selected and surveyed in 1923. The harbour is safe and commodious and is said to open out remarkably early in the summer.



View showing the new post established during the 1924 Expedition. It is situated on North Devon island and the photograph was taken shortly after the opening ceremonies on August 26.



Mr. F. D. Henderson, commander of this year's Expedition, delivering mail to Ki-wat-soo, wife of the Eskimo Noo-kud-lah who was convicted of murder during the 1923 patrol and is now serving a ten-year sentence in Stony Mountain Penitentiary, Manitoba.

Ten days of strenuous work were required to land material and supplies, and to erect a barracks and a storehouse. On August 26 all being complete, the new post was opened with suitable ceremonies.

Proceeding from Ponds Inlet to Navy Board inlet, a stop was made at Canada Point on Bylot island where some seams of coal were noticed. During several days stop at Ponds Inlet where the engines of the ship were being overhauled, a party made an exploratory trip of some 12 miles inland up Salmon river. Three lakes were noted and ripe blueberries of good size and flavour were found in abundance on the hill-sides. It is from a mine on this river about four miles from its mouth that the Hudson's Bay Company gets its supply of coal for the post, and it is the intention of the police to make a beginning this winter in getting their coal locally.

On the way southward a call was made at Clyde, a new Hudson's Bay Company's post established last year. The post of the Sabellum Trading Company, which like Clyde is on the east coast of Baffin island, was also visited. The remainder of the voyage was made in good time without mishap and the ship docked at Quebec on September 25, having been absent over two and a half months.

Important scientific work was done. Barometric instruments were installed on the ship by the Dominion Meteorological Service, and readings were taken throughout the voyage. Surveys and magnetic observations were under the

(Continued on page 5)



The Kane Basin Detachment on Ellesmere island. This post, which is 750 miles from the North Pole, will be visited by the Mounted Police stationed at Craig Harbour.

The good steamship *Arctic* is safely back again in Quebec after an adventurous voyage of over two months in the ice-laden seas of the Arctic ocean. The purpose of the voyage was to learn more of Canada's little known north-land, to establish two new posts and to leave supplies at the posts established last year, to make scientific observations and to find out as much as possible in the limited time available about the resources of this vast northern region. Captain J. E. Bernier, the doughty mariner of seventy-odd summers, was again in command of the vessel, while Mr. Frank D. Henderson, D.L.S., was in charge of the scientific and investigatory work for the Department of the Interior, which sponsored the expedition.

The voyage, as was to be expected, was not without its perils and adventures. Leaving Quebec on July 5, the *Arctic* proceeded down the river and gulf of St. Lawrence passing through the strait of Belle Isle on the 11th and heading northward for Cumberland sound. The next day when 150 miles from Belle Isle a fifty-mile gale swept over her. Being so very heavily laden she rode low in the water and was ill-suited to meet the buffeting of the storm. A tremendous wave broke over her flooding the engine room, putting out the fires and shifting the cargo to such an extent that she took a decided list to port. The men worked like Trojans but things seemed to go from bad to worse. Finally it was decided on the morning of the 13th to throw overboard the deck load of coal. This was done, but so roughly had the vessel been used that it was not until the evening of the 17th that her engines



## NORTHERLY ADVANCE OF CORN BELT\*

### Successful Attempts at Corn Growing in Western Canada— Future Seems Assured

Not many years have elapsed since corn growing in northern Illinois was thought to be a somewhat risky undertaking. Now the state of Illinois is considered to be about the centre of the corn growing area. Wisconsin, Minnesota, and the Dakotas have all become corn growing states and the advance of the corn plant has continued across the Canadian border into Manitoba, Saskatchewan, and Alberta and in these provinces each succeeding year sees corn being tried a little farther north. In recent years these attempts have been associated with a fair degree of success, so much so that the future of corn growing in the Prairie Provinces seems assured.

Not only has corn been advancing steadily northward across the prairies but this year a report from the Dominion Experimental Substation at Swede Creek in the Yukon Territory near the Alaska Boundary showed that on August 1, a dwarf variety was forming ears. This is a good omen for the ultimate success even in that northern area.

Considering however the prairie farming area, the possibilities of corn growing in the northern parts is indicated by the success that has attended the efforts at the Beaverlodge and Fort Vermilion Dominion Experimental stations, both situated in northern Alberta. At the latter station, which is about 650 miles north of the International Boundary, the Department of Agriculture has for a number of years conducted variety tests with the more common commercial varieties of field corn, including Wisconsin No. 7, White Cap Yellow Dent, Bailey, Longfellow, North Western Dent, Quebec No. 28, Canada Yellow, etc. These varieties ranged in yield of green material in 1922 which was a good corn year from 15½ tons in the case of Wisconsin No. 7 to 24½ tons in the case of Longfellow. The experiments showed that with better adapted types profitable crops of corn fodder should be possible. At Beaverlodge, smaller yields are usually secured, but here also sufficient fodder is obtained to promise an encouraging future of adapted corn varieties. At stations in the more southern sections of the Prairie Provinces crops of fodder are being secured, from the varieties previously mentioned, that in many cases compare favourably with what is produced through eastern Ontario. Under irrigated conditions at Lethbridge, in southern Alberta, as high as 48 tons of green fodder per acre has been secured in exceptionally favourable seasons, and seldom has it not been possible to produce profitable crops.

In the experiments conducted at Brandon, Manitoba, for four years with ten varieties of corn, the yields as harvested ranged from 11½ tons to 19½ tons. These results indicate that the possibilities of corn growing for fodder purposes in the southern Manitoba section are very encouraging.

\* Prepared under the direction of Dr. J. H. Grisdale, Deputy Minister of Agriculture, by Dr. G. P. McRostie, Dominion Agrostologist.

Such early maturing varieties as Gehu, Improved Squaw, Manitoba Flint, early selections of North Western Dent, North Dakota White Flint, Howe's Flint, etc. can be ripened each year with a fair degree of certainty and serve as a source of grain corn.

Some growers who planted corn without consideration of variety, soil treatment and suitable locality have been disappointed. In view of the fact, however, that corn breeding is only in its infancy and that varieties at present existent will grow over a large area of the Canadian prairies it seems reasonable to expect profitable corn growing in the future to continue to extend northward even beyond the line of present day settlement.

## SODIUM SULPHATE IN CANADA\*

### Extensive Deposits Have Been Proven In Prairie Provinces— Development Work Proceeding

The Prairie Provinces of Canada are regarded primarily as agricultural areas and up to the present time they have not been considered seriously as probable contributors to the mineral wealth of the country. Recently, however, the resources of these provinces in non-metallic minerals, such as clays, coals, oil, gas, and sodium and magnesium salts have been attracting the attention of capital with the result that considerable activity is evidenced in all the minerals mentioned.

The steadily increasing interest in the sodium sulphate deposits induced the Mines Branch of the Department of Mines, Ottawa, to institute a detailed investigation of such deposits to determine, if possible, the economic value

and the extent of reserves. The work has been in progress during the field seasons of 1921, 1922, and 1923.

Natural occurrences of soluble mineral salts are known in the provinces of Manitoba, Saskatchewan, Alberta, and British Columbia, either in the form of bedded deposits or as brines. Some are of considerable extent and are probably of sufficient size to warrant commercial exploitation, provided economic methods of recovery can be developed and markets secured.

Two of these deposits are being operated and plans are under way for the opening up of other deposits. Salts and Chemicals, Limited are operating a deposit at Dana, Saskatchewan, for the recovery of sodium sulphate from the bed of Muskiki lake, 23 miles west of Humboldt, Saskatchewan. The crude salts, running approximately 95 per cent hydrous sodium sulphate, are harvested in the winter months and placed on stock piles from which they are later treated in the company's drying plant on the property. The crude salts are treated, reprecipitated in the anhydrous form and dried ready for the market. The capacity of this plant is 100 tons of dried salt per day of 24 hours.

At Frederick lake, five miles southwest of Dunkirk, Saskatchewan, and 38 miles from Moose Jaw, Saskatchewan, another salt cake recovery plant has been erected by the Bishopric and Lent Company. At this plant a large amount of experimental work has been carried out on various methods of drying and as soon as their processes are proved commercially successful, further units are to be added.

Deposits of natural sodium sulphate are known at many localities in Western Canada and a number of these are of large extent. The deposits vary in composition but they are essentially mixtures of hydrous sodium and magnesium salts with small percentages of calcium sulphate, sodium chloride, sodium carbonate, etc. The hydrous sodium sulphate content in most of the deposits investigated is in excess of 80 per cent.

The main market for sodium sulphate in Canada at the present time is with the paper mills, which use between forty and fifty thousand tons each year in the manufacture of kraft paper. A small tonnage of the hydrous crystals as taken from the lakes is marketed for use in the tanning and textile industries.

The work so far carried out by the Mines Branch has necessarily been confined to only a small proportion of the total number of the deposits known; nevertheless, a quantity in excess of 50,000,000 tons of hydrous sodium and magnesium salts have been proven, and the prospects are that this figure will be greatly exceeded as the investigation proceeds.

The operations of the companies mentioned above (and the possibility of other deposits being opened up in the near future) should bring the mineral possibilities of the western provinces before the public and should form the nucleus of an industry which in time should prove of great importance to the whole of Canada.

\* Prepared under the direction of Dr. Charles Cammell, Deputy Minister of Mines, by Mr. L. H. Cole, B.Sc., Mines Branch, Ottawa.

## TRANSPORTATION IN FAR NORTH

### Huskie Dogs Provide Means of Travel Over Snows of Canada's Vast Hinterland

What the camel is to the desert and the motor car is along macadamized roads, the "huskie" is to travellers over the snows of the far North. The efficiency of the dog team as a means of travel is shown by the fact that a trained team can make a distance of 40 miles a day and maintain this speed for days together. Used largely to assist commercial enterprise, the "huskie" also does his part in forwarding the interests of justice and order. The Royal Canadian Mounted Police has 128 trained dogs in its service of which 98 are in use in the Northwest Territories, Yukon, and the province of Manitoba. These dogs and sleds are employed for travelling between the scattered posts, for carrying the mails, hauling wood and various other supplies, and for patrol purposes, investigating a murder charge or reporting on some other case.

The origin of these dogs is not definitely determined. The pad on the foot of the "huskie" is tougher and stronger than that of the domestic dog, which wears out quickly on the sharp, frozen surfaces of the ice and snow. Where it is possible to procure nourishing food, the dogs are bred by the Police, but many of the teams are purchased. A good serviceable dog can be bought in Greenland for \$5 and brought across to Canada whereas the purchase price at Winnipeg is from \$40 to \$50 and sometimes as high as \$100 in the Mackenzie district. At the age of one year he is ready for the harness and is hitched into the team, where under the combined influence of the driver and the dog-leader he speedily becomes efficient, sometimes in the course of a single day. Between the ages of three and five years he is generally at his best. As a rule the teams are composed of from five to seven dogs, and occasionally one sees three teams of seven dogs each combined pulling an upgrade load. The average team is hitched in tandem to the sled when the snow is deep and soft, but it also travels fan-shape where the going is level and hard. The harness which is made up of collar and belly-band with traces, is of leather. As is the case with all animals of intelligence,

the dogs quickly recognize the fact of human personality and bend to the will of the driver who means business. While largely a matter of trails, loads are figured out to the ounce especially for a long trip. Each dog is calculated to pull a load of 125 pounds. The average dog does not like to leave the beaten track, but an intelligent dog when he hears the order "gee" or "haw" knows it is all right and does so.

The "huskie" is of different colours, some teams being entirely black. However colours do not lessen or increase the dogs' efficiency and where the colours match it merely reflects the preference of some driver who takes special pride in his team. The dogs are fed but once a day and then only in the evening. At the end of a trip the men cut the wood for a fire, unload and prepare their camp and have their meal while the dog-feed is being prepared, viz. either thawed or cooked. To prevent fighting over the meal, each dog is tied up to a separate tree or the driver stands over them with a whip while they are eating. The regulation meal is from three to five pounds and consists generally of dried or frozen fish or meat, or warmed corn, oat-meal, or rice to which tallow is added to get the needed fat. In the winter the dogs rely on the snow for drink.

Like the dog of civilization, he is also subject to distemper and every now and then some mysterious epidemic will kill the animals in numbers. They are decidedly clanish and herd together in cliques. A dog who wants to rejoin his special camp will make a wide detour to avoid falling among those of another clique. Whereas the Indians let their dogs shift for themselves in the matter of quarters, the Police dogs are kept in kennels in a corral with boughs of trees serving in the place of straw, a practice which serves to keep them out of the wind and renders them more get-atable when wanted quickly.

The Canadian Rockies afford magnificent sport for the big-game hunter. Grizzlies, bighorn sheep, and mountain goat abound.



# NATURAL RESOURCES CANADA

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OTTAWA, NOVEMBER, 1924

## SOCKEYE SALMON RUNS HEAVY

Department of Marine and Fisheries Reports  
Bumper Collections of Eggs

The prospects for a bumper collection of sockeye salmon eggs for the hatcheries operated in British Columbia by the Department of Marine and Fisheries are unusually good. Most encouraging reports have been received at Ottawa indicating that the runs of sockeye are considerably in excess of other years. In the Fraser river all previous collections of sockeye eggs have been exceeded with a take of 5,000,000 in the Pitt Lake area, and the run of sockeye to the Birkenhead river in the Harrison-Lillooet Lakes area is greater than any previous run in the memory of the hatchery employees. The collection of eggs amounting to 31,200,000 is the largest that has been made to date in this portion of the Fraser.



Dundas Harbour, North Devon island, looking east. Storehouse of the Royal Canadian Mounted Police is shown in right-hand corner.

## REPLENISHING INLAND FISHERIES

### Importance of Work of Dominion Fish Cultural Service— Methods of Propagating

As the fisheries of Canada are one of its chief natural resources and fill such an important place in its commercial life, the Department of Marine and Fisheries operates no less than 41 fish hatcheries, which are located at strategical points between the Atlantic and the Pacific, for the purpose of replenishing the rivers and other inland waters.

Fish Culture or Aquaculture holds a somewhat similar place with regard to the water as agriculture does with regard to land. The former aims at the largest annual crop of fish of the most valuable kinds that the respective waters will produce.

During the spawning season the ripe females are skillfully manipulated by trained employees and their eggs are extruded by a gentle pressure into pans where they are carefully fertilized with the "milt" of the male fish. The fertilized eggs are carried in jars and trays in running water in the hatcheries until the young fish or "fry" hatch out. During this period they are safe from injury from freshets which would scour out the spawning beds; from receding waters, which would leave them exposed; from severe frosts, which would kill them; as well as from the ravages of fish, egg-eating birds and many other natural enemies. In Canada the eggs of the fish that spawn in the autumn hatch out in the following spring, or in a period of from five to six months, while the eggs of the spring spawning species hatch in from four to six weeks.

When the "fry" are first hatched they subsist upon the contents of a yolk or food sac and when this is practically consumed and they begin to rise from the bottoms of the troughs in search of other food they are transferred as speedily as possible in cans, or sows, to the waters that it is desired to stock. The absorption of the food sac takes from three to four weeks, but this as well as the hatching period is affected by the temperature of the water. Warm water gives quicker results than cold water.

As the vitality of the little fish increases rapidly as they grow older, the facilities available at the various hatch-

eries for feeding and rearing the fry so that they may be carried until they reach the "fingerling" stage are being developed and last year the distribution of "fingerlings" and older fish from the Dominion Government hatcheries was increased twenty per cent to a total of thirty-five and a half million. So far as is feasible the distribution is arranged on a "standard" basis. Streams and lakes are examined and classified according to their physical condition, the extent to which they are fished, and their general value from a fish-producing standpoint.

Since its inception the Canadian Fish Cultural Service has given almost its whole attention to the propagation of the more important food fishes such as Atlantic salmon in the eastern provinces; whitefish, salmon, trout, and pickerel in Ontario and the Prairie Provinces, and Pacific salmon in British Columbia, while the demands of anglers has resulted in the recent inclusion of such game fish as speckled, rainbow, cutthroat, and kamloops trout. Some of these species are also becoming established in water to which they are not indigenous. Pacific spring salmon are being caught in lake Ontario, and eastern whitefish, black bass, and Atlantic salmon are being taken in British Columbia lakes and rivers. Rainbow trout are being introduced into streams on the eastern slope of the Rockies in Alberta; and experimental plants of the same species are being made in Nova Scotia, of Brown and Loch Leven trout in New Brunswick, and of lake Ontario and lake Superior herring in alkaline lakes in Saskatchewan.

That the fisheries of the country have been maintained and increased in all waters that have been systematically stocked with hatching fry, while similar waters that have not been so assisted have become depleted are well-known facts. For instance in 1895 whitefish had become so scarce in lake Ontario that there was practically no commercial fishing whereas by 1917 the commercial catch amounted to 12,034 cwt. and in 1922 to 21,020 cwt. This improvement is credited by those directly interested to the hatcheries on both sides of the lake.

## C.G.S. "ARCTIC" RETURNS FROM ANNUAL NORTHERN PATROL

(Continued from page 1)

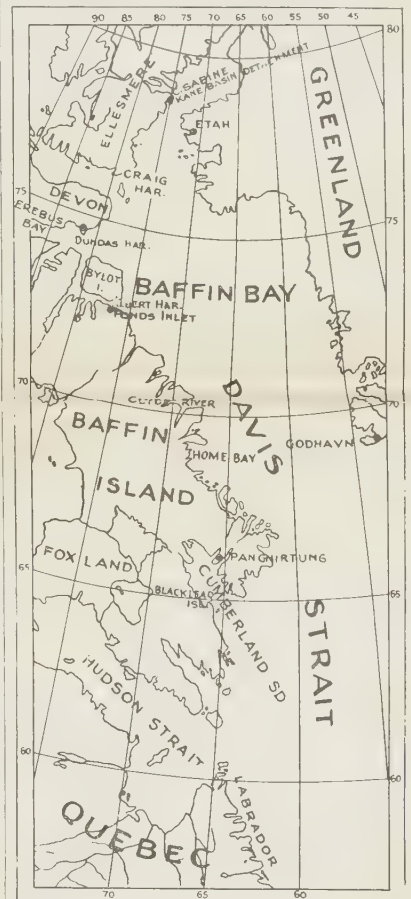
direct charge of Mr. Henderson whilst the official photographer, R. Tash, obtained many excellent still pictures in addition to about 6,000 feet of moving picture film.

Radio now plays an important part in all scientific expeditions to lands that are little known. The *Arctic* was fully equipped with wireless instruments which kept her in touch with the civilized world. Press matter was fairly consistently received from Louisburg, Nova Scotia, except for about two weeks when the ship was far north in perpetual daylight. Sixty-six messages were received from Pittsburg (Station 8XS). The amateur transmitter was found to give good service up to 3,000 miles. When in the vicinity of Dundas Harbour and Ponds Inlet communication was had with several amateurs in Canada and the United States. The *Islands Falk*, a Danish patrol boat off the Greenland coast, relayed a number of messages at a time when direct communication with Louisburg was cut off.

The amended regulations for grading butter and cheese for export are contained in the pamphlet, "Acts, Orders, and Regulations No. 14" recently issued by the Department of Agriculture at Ottawa, Canada. Four grades are provided both for cheese and butter, being designated "Special", "First", "Second", and "Third" grade. The regulations provide that every cheese, and every package containing cheese or butter, shall be marked at the factory with the vat or churning number, which should run consecutively throughout the calendar year, commencing with Number 1.

Three varieties of fruits and two of plants were accepted for recording at the recent meeting of the Plant Registration Committee of the Canadian Horticultural Council. The fruits were the Sangster peach, the Golden Delicious apple, and the Newman strawberry. The George C. Creelman lilium and the Lady Atholstan fern were the new varieties of plants.

Encouraging results are reported from the throwing open to grazing of selected areas in Alberta forest reserves, and as the northern districts are opened up considerable increase is expected. The grazing in these districts is favourable to the forests through reducing the fire hazard.



Map showing Davis strait, Baffin bay and points visited by the *Arctic* during the last patrol.

Canada's national parks in the Rocky mountains are nearly as large as Belgium and two-thirds as large as Switzerland.

Of the 300 million acres fit for farming in Canada, one-third is in farm holdings; only one-sixth is cultivated; and 250 million acres await the plough.

Since the Dominion Government, through the Forestry Branch of the Department of the Interior, inaugurated its free trade distribution scheme on the prairies, some 40,000 plantations have been established. Many of these are valued by the owners at \$1,000 apiece. Even at a conservative estimate of \$300 apiece these plantations represent a total of twelve million dollars, many times the entire expenditure of this branch on the work from the time it started.



## INCREASE IN MOTOR TRAVEL TO THE PARKS

Canada's Great Scenic Playgrounds Attract Many Tourists—New Camps Popular

The increase in motor tourist travel to the Canadian National parks this year is one of the outstanding features in connection with tourist activities in these great scenic playgrounds. Recent reports received by the Commissioner of Canadian National Parks, Department of the Interior, show that to date the number of motor tourists visiting Rocky Mountains National park (Banff) is far in excess of the record season of 1923. Figures from Waterton Lakes and Point Pelee parks also show substantial increases.

The report from Rocky Mountains park showed that in the month of August alone, 4,710 motor cars passed through Kananaskis Gateway, which is the eastern entrance to the park. To the 26th September, the total registrations at Kananaskis numbered 14,593, marking an increase of 5,384 over the registrations for the corresponding period of 1923.

At the entrance to Kootenay National park, the medium of travel to Rocky Mountains National park from the west, 2,873 motor cars registered in the month of August, while for the season of 1924, to the 26th September, the registration totalled 7,211. As this is 3,052 more cars than were recorded in a like period for 1923, it will be seen that the increase is a very substantial one.

The establishment of motor camp sites, equipped with many camping comforts, has been an inducement to transient vacationists to prolong their stay in the parks. Mount Rundle camp, which is situated at Banff, and is one of the most complete in Western Canada, has been visited this season by more tourists than ever before, the registrations at this camp being as high as 276 cars in a single day, which represented about 1,300 people being accommodated at one time.

It has been estimated that the annual loss in Canada to field orchard and garden crops, due to destructive insects, is more than \$200,000,000. The consumption of insects by birds prevents this loss from being far greater, and this forms one of the strong arguments for the protection of insectivorous birds.

The reports of the state of the antelope herd in the antelope reserve maintained by the Canadian National Parks Branch at Nemiskam, Alberta, continue most satisfactory. There are now 180 of these animals in this reserve, their numbers having increased by fifty in the past year. The experiment has demonstrated that antelope can be successfully bred in semi-captivity.

Tobacco is grown in Ontario in the counties along the shore of lake Erie; in Quebec, in the counties near Montreal, along the St. Lawrence; and in the Okanagan valley, British Columbia.

In meeting the need for winter feed for the buffalo and other animals in the park at Wainwright, Alberta, the Canadian National Parks Branch of the Department of the Interior is experimenting with the growing of sunflowers. Good results have been obtained so far and it is likely that the tests will be extended.

## CANADA'S FOREST AT WEMBLEY

Exhibit Form Important Part of Dominion's Contribution at British Empire Exhibition

The economic value to Canada of her great resources in forests—second only in importance to agriculture—can best be realized by a statement of their vast extent. One-third of the total land area of the Dominion, it is estimated, may be described as forest lands, of which 900,000 square miles are mainly covered by softwoods and the remaining 300,000

pile until required, when they were conveyed to the mill to be ground. All the operations were carried on by power developed from the river.

The Canadian exhibit also included an electrically-driven compound-lever testing machine, capable of applying a load of 10,000 pounds. This machine was similar in general construction to



Canada's Forests at Wembley. This scenic model of a pulp mill in the Forestry section of the Canadian Pavilion at the British Empire Exhibition attracted great attention.

square miles bear chiefly hardwoods. In view of this it is not to be wondered that the Canadian Government's forest products display at the British Empire Exhibition at Wembley, England, formed an important part of the Dominion's exhibit, and was the centre of the greatest interest to the thousands of visitors who passed through the Canadian Pavilion each day.

The forestry exhibit occupied a space 100 feet in length and 35 feet in width, which could be entered from the main corridor. It was surrounded on three sides by panelled spaces surrounding glazed wall-cases, and separated by groups of timbers and timber products. The panelling was surmounted by decorative scenes or by stage settings of forest scenes. A temple-like structure in wood occupied the middle of one side, and contained a scenic model of a pulp mill. Two island exhibits stood towards the two ends, one being a group of rolls of paper, and the other a stand for microscopes and photographs. Large timbers and a section of a large wooden pipe occupied the remaining space. The decorative features included paintings illustrating four stages in the journey of the logs from the forest to the lumber mill, and showing the progress of the industry during the last four centuries.

There were eight large spaces covered with panels of Canadian woods, each space containing 25 panels. Forty kinds of wood were shown in this way, and the different kinds of wood were grouped so that allied species might be compared.

The central figure in the paper section of the display was a scenic model of a typical Canadian pulp mill for the manufacture of groundwood pulp. The scale of the model was three-sixteenths to one foot and the capacity of the mill represented was 100 tons per day. The scene showed the river which brought the logs, which were then cut into short lengths and freed from bark. These blocks were stored on a

those employed at the two laboratories of the Forestry Branch, Department of the Interior, at Montreal and Vancouver for testing timbers. The machines at these laboratories are, however, capable of greater loads, and of testing to their breaking point large structural timbers.

The Tree Planting Division of the Forestry Branch of the Department of the Interior in 1923 distributed some five and a quarter million trees to farmers in Manitoba, Saskatchewan and Alberta, and since this work began, has supplied, free, some seventy-five million trees for shelter-belts about prairie homesteads.

The Takakkaw falls in the remarkable Yoho valley, Canadian Rockies, is more than six times as high as Niagara.

In the province of Alberta there are eight forest reserves, the total area of which is about 18,620 square miles. These have been set aside with the idea of maintaining a timber supply and conserving the flow of the rivers.

South of the Churchill river in Saskatchewan there are thirty-two million acres of forest land unfit for agriculture. Of this area about one-fifth (somewhat over six million acres) has been set aside as forest reserves.

The Department of Marine and Fisheries reports that the prospects for a bumper collection of sockeye salmon eggs in Owekano lake, Rivers Inlet, are very promising, and some of the streams in this district are at present carrying the largest run of sockeye in several years. A peculiar feature of the run to this lake this year is that it is approximately two weeks' earlier than it has been for some years and the fish are unusually large.

## THE NAME "QUEBEC" IS OF INDIAN DERIVATION

Interesting Facts Concerning Its Origin Uncovered By Geographic Board

In tracing up the origin of place-names in the Dominion the investigations of the Geographic Board of Canada have brought to light the interesting facts given below concerning the name Quebec. The first known appearance of the name Quebec is on a map made by Guillaume Levasseur of Dieppe in 1601, if Henri Harrisse is not mistaken in the date. The spelling is Quebecq. The first appearance of the name in a book is in Lescarbot's History of New France published in Paris, in 1609, a copy of which is in the Library of Parliament at Ottawa. Lescarbot's spelling is Kebec, without any accent, and he used it in describing Champlain's voyage of 1608, of which he had learned orally from the explorer. Quebecq is the spelling used by Champlain in his own account of his voyages published in 1613.

The first white man to visit the site of the present city of Quebec was Jacques Cartier in 1535 and there he found the Indian town of Stadaconé. Cartier notes that there is a narrows of the river here. Seventy-three years after, in 1608, came Champlain. He found no settlement of any kind. Stadaconé and the Huron-Iroquois people dwelling there had disappeared. Champlain writes "Quebecq which is a strait of the river" and in the account of his voyages, published in 1613 states that he sought a place for a house and found none better than "the point of Quebecq, so called by the Indians". In the 1632 edition of his voyages he reaffirms that Quebecq is so called by the Indians.

The striking feature of the geography of Quebec, noted both by Cartier and Champlain, is that the river St. Lawrence is "shut in", "obstructed" or "narrow" here. Indeed where the Canadian National Railways bridge crosses the river, five miles above the citadel of Quebec, is the narrowest part of the St. Lawrence between Montreal and the gulf. The breadth of the river here between high water lines is 2,440 feet. From the Indian appellation for this narrowing of the river has been derived the name now borne by the province and city of Quebec. Such authorities on Algonquin Indian languages as Fathers Albert Lacombe and Georges Lemoine, whose Cree and Montagnais Indian dictionaries are well known, are agreed that this is the meaning of the name. The Rev. Silas T. Rand, a missionary among the Micmacs of the Maritime Provinces for forty years mentions two places in Nova Scotia called Quebec by the Indians, the Narrows above Halifax and a narrow place in the Liverpool river below Milton.

Some have vaguely surmised that Quebec is a French name because in certain parts of France tongues of land formed by the junction of two rivers have names ending in "bec" as Bolbec, Caudebec, Carbec.

In this connection the Abbé Gosselin remarks that if the word were French, pure and simple, it would have had a definite spelling in the early days. This it apparently never had as some 17th Century writers followed Lescarbot's spelling and others that of Champlain, with or without the final "q".



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## INDIANS CONTINUE TO ADVANCE AND PROSPER ON FARMS\*

REPORTS INDICATE ANOTHER  
SUCCESSFUL YEAR

**Wards of the Government Are Rapidly  
Becoming Self-Supporting—General  
Conditions Improve**

The continued advancement and growing prosperity of the Indians of the three Prairie Provinces as indicated in recent reports of this year's farming operations confirm the belief which officials of the Department of Indian Affairs have long held, that given a fair opportunity and proper instruction the Indians would in time become self-supporting and independent. Both in grain growing and in cattle raising these wards of the Government have shown that they can successfully compete with the white man, and they are also rapidly adapting themselves to other lines of farming.

The Indians this year sowed approximately 70,000 acres of land. This crop was well put in and notwithstanding the unfavourable growing conditions throughout the season, it is confidently expected the yield will equal the million-and-a-quarter-bushels return of last year. Between fifty and sixty machines, almost wholly operated by the Indians, were required to thresh the harvest. An ample supply of hay for the Indians' own use has also been put up.

Very few cattle losses were suffered by the Indians in the Prairie Provinces during the winter, and as the natural increase was good their herds have enlarged by over 6,000 head. Indian cattle in Alberta and Saskatchewan are said to be equal to any grade in these provinces, and last year two lots entered in the Winnipeg Stock Feeder Show were awarded first and third prizes. In addition to the cattle, the Indians own over 22,000 head of horses and about 2,400 head of other stock.

Looking towards their future welfare, educational work among the Indians has been expanded. Several new schools have been built recently and others are under construction. Last year the total enrolment of Indian school children was 13,723, approximately one-third of these being in Manitoba, Saskatchewan, and Alberta. Agricultural instructors have been employed on some of the reserves, with the result that grain growing and stock raising methods have been greatly improved.

### RESULTS ON BLOOD RESERVE

During the last two years all the able-bodied Indians on the Blood Re-

\*Prepared under the direction of Dr. Duncan C. Scott, Deputy Superintendent General of Indian Affairs, Canada.

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## OUR RECREATIONAL RESOURCES

Growing Realization of Value of These Unique Assets—  
Development Work of Interior Department

What is the next great opening for advance in the commercial development of Canada's resources?

In the last twenty-five years Canada has ridden forward on the crest of a series of remarkable natural resources developments. First, with a receptive world market for wheat, the free farmlands of the West drew one of the most spectacular land settlement

Already the Dominion's annual income from such business runs into a large item, but there is every sign that we have merely scratched its revenue possibilities. Here are a few of the chief facts in the situation.

In the country bordering Canada clear across the continent lives a nation of enormous wealth. A great portion of its 110,000,000 people have



Our Recreational Resources—View of an alpine camp in Yoho National park in the Canadian Rockies.

movements the world has ever seen. Later, with an equally hungry market for paper in the United States, our pulpwood forests and water-powers reared in an incredibly short period the giant Canadian pulp and paper industry of to-day. Still more recently another major force has appeared and seized the spotlight in the astonishing growth of mining enterprise in the gold-fields of Ontario and Quebec.

These three developments typify the manner in which the business life of the Dominion has been periodically reinforced by the commercial arrival of resources previously unknown or neglected.

What resource will yield the next big contribution to the current of Canadian business? What natural assets have we still lying hidden or neglected? Or, equally important, is there lying anywhere within our grasp a large business opportunity which we have the resources to meet?

### A PRIZE OF INTERNATIONAL TRADE

There is at least one direction in which Canada appears to enjoy a golden opportunity—the attraction of profitable tourist traffic from abroad.

the means and inclination to travel. They own five or six times as many passenger automobiles as the rest of the world put together. The annual value of their travelling expenditure is enormous. Last year the United States Department of Commerce set the huge amount of \$760,000,000 as being the net sum of the flow of American money abroad through the outlay of tourists, immigrants' remittances, and relief contributions. The item of tourists' expenditures may have been one-half or perhaps only one-third of the total. Even if it were but a quarter, or \$190,000,000, the capture of American tourist trade is clearly one of the big prizes of the business world.

### CANADA'S COMPETITIVE ADVANTAGE

What about Canada's position to compete for this commercial "plum"? Briefly our situation is unique. It is without parallel in commercial history. We have everything in the way of natural resources necessary to attract the traveller, the sportsman, the vacationist. We have the hunting territory, the game fisheries, the waterways, endless variety of scenery, the summer climate—all of these and more.

(Continued on page 3)

## RECENT QUEBEC FLOODS PROVIDED INTERESTING DATA

OCCURRED AT AN UNUSUAL  
SEASON

**Heavy Rains Caused Several Rivers to  
Overflow Banks—New Run-off  
Record**

The Dominion Water Power and Reclamation Service of the Department of the Interior in co-operation with the Quebec Streams Commission has gathered some extremely interesting information concerning the two floods that visited certain sections of Quebec in September and October last.

These two floods were remarkable, not only for the fact that they caused higher stages on a number of streams than have hitherto been recorded, but also, because they occurred at an unusual season since the usual flood period follows the thaws and break-up of the Spring.

Extreme floods are seldom due to any single cause but are the result of a number of pre-disposing conditions. The floods of September and October were the result of rains culminating in downpours of storm intensity following a wet summer season. The heaviest rainfall recorded in the areas affected during each storm was over six inches and this, falling upon ground that was already saturated, rapidly appeared as flood water in the various creek and river channels.

The first flood occurred about September 11th to 14th and, though it affected the northern tributaries of the St. Lawrence which was its immediate cause, centred upon the St. François River basin to the south of the St. Lawrence and caused unprecedented floods in the lower reaches of the St. François river.

The second flood occurred about October 1st to 3rd and in this case the storm had no marked effect south of the St. Lawrence but was of greatest intensity in a belt 40 to 50 miles wide north of the St. Lawrence and extending from Three Rivers to Murray Bay. North of this belt the precipitation gradually became less and for this reason the floods were of greatest intensity on the shorter tributaries of the St. Lawrence and were less severe on the longer rivers.

It is interesting to note that the storage reservoirs on the St. François and other rivers played a remarkable part in lessening the extreme conditions to which the flood would no doubt have attained had not these reservoirs operated to withhold a proportion of the run-off. The storage dams in the St. Maurice river and particularly the Gouin dam also assisted materially in restraining the floods on this river although the intensity of the rainfall

(Continued on page 2)





Jubilee street, Sherbrooke, Quebec, during the flood of 11th September, 1924. This is typical of scenes throughout the inundated areas.

## RECENT QUEBEC FLOODS PROVIDED INTERESTING DATA

(Continued from page 1)

in the upper portion of the basin was very much less severe.

As has been already indicated the first flood was the only one which had serious effect on the St. François river. The water rose nearly 20 feet at such points as Sherbrooke and Richmond and the accompanying flow was equivalent to a run-off of 18.8 cubic feet per second per square mile of drainage as compared with 15.0 second-feet the highest previously recorded.

### HIGH RUN-OFF RECORDED

The greatest effect of both storms, so far as reliable records show, seems to have been felt on the Ste Anne de Beaupre river where the run-off per square mile reached 80 and 105 second-feet respectively as against a previous record, over a period of twelve years, of only 50 second-feet.

The Montmorency experienced run-offs of 68 and 74 second-feet per square mile respectively during the two floods; the Jacques Cartier 34 and 60 second-feet respectively, the former being a trifle greater than the previous record. The Ste Anne-de-la-Perade river established new records of flow far exceeding the previous high of 26.8 second-feet per square mile of drainage area, the floods reaching 44.6 and 67.0 second-feet respectively.

The flow of the Batiscan only exceeded the previous record of 13.5 second-feet during the second flood when a flow of 21.4 second-feet per square mile was attained, the first flood barely exceeded one-half this flow.

As has already been stated the excessive downpours of September and October did not occur in the upper waters of the longer rivers such as the St. Maurice, in fact, while the total September precipitation at the mouth of this river was 7.52 inches and 8.90 at La Tuque it barely exceeded 3 inches at Manouan and Gouin Dam. Both floods were felt on this river but due to the more moderate rainfall in the headwaters and to the effect of the storage reservoir, the run-off was only 42 per cent and 45 per cent respectively of the previous maximum; it should be noted, nevertheless, that for the season of the year the flows were the highest hitherto recorded.

The floods on the rivers mentioned and upon others which cannot be specified in detail here, were without question extremely severe but the most remarkable feature is, as has already been indicated, the season of the year during which they occurred. The stream flow in this portion of the Dominion is well maintained during the autumn but excessive flow is only looked for during the period of spring break-up and the occurrence of record-breaking floods in the fall of the year was quite unprecedented.

## SOCKEYE SALMON IN THE FRASER RIVER

### Value of Hatcheries Shown in Varying Conditions in British Columbia Waters

With a view to re-establishing sockeye salmon in the Upper Fraser river the Department of Marine and Fisheries has this season distributed 1,000,000 eyed sockeye eggs in the tributaries of Bowron lake and 4,000,000 in the principal tributaries of Quesnel lake. Arrangements have also been made to make similar plantings in the Seton-Anderson Lakes and the Shuswap Lakes districts.

An inspection of the salmon spawning areas of the Fraser River basin has shown that the number of sockeye salmon that reached the spawning beds of the Fraser, above Hell's Gate Canyon was too small to make a visible impression in any section. Not a sockeye was in evidence in Quesnel lake or its two main tributaries, and not a resident at Quesnel Dam, the outlet of the lake, or on the Horsefly river, one of its principal spawning areas, was found who had seen a sockeye this year. Formerly the Quesnel Lake section was one of the greatest spawning districts in the Fraser basin. The records kept there disclose that in 1909 over 4,000,000 sockeyes entered that lake. None are known to have entered it in the last two years.

The Indians in the Chilcotin country reported that they have not taken in excess of 50 sockeye at their three principal fishing stations this year. None were caught by the Indians at Chimney creek or at Soda creek. The Indians at the Bridge River canyon on the Fraser, above Lillooet, caught very few sockeye and none were seen entering Seton or Anderson lakes. A few were seen in the Thompson river.

It was also reported that the sockeye run to the Birkenhead river at the head of the Harrison-Lillooet section was the best in many years. More sockeye were seen there this year than have been seen since the hatchery was established in 1905 and it is the belief that the run was as great as it ever has been in the last twenty years.

While it cannot be stated with absolute certainty that the abundance of salmon in the Birkenhead river is due to the fry distributed there from the hatchery four years previously, there is scarcely any other agency to which it can be attributed. It is only in the Lower Fraser, where hatcheries have been operated, that the sockeye run has been maintained, and in the Upper Fraser, in the Quesnel, Chilcotin, and Seton Lakes districts, where there are no hatcheries, the run has disappeared.

# APPLE GROWING IN CANADA\*

## Industry Is Spreading to All Parts of Dominion—Finest Fruit Is Produced

Fruit growing has become one of the chief industries in Canada and by far the most important species produced is the apple. This is due no doubt to the fact that the Dominion produces the best flavoured, most highly coloured, and longest keeping apples. The apple may be grown successfully in commercial quantities over an immense area, so great in fact that if it were planted to apple trees the product would be sufficient to supply the markets of the world. The crop of apples that will be harvested this year is estimated at 3,225,713 barrels, which is about 72 per cent of the 1923 crop which reached 4,493,850 barrels. The extent of the industry may be gathered from the following table showing the crop of apples in the five principal producing provinces in 1923 and 1924:—

	1923	1924 (estimated)
	Bbls.	Bbls.
New Brunswick..	69,292	86,615
Nova Scotia..	1,821,064	1,274,742
Quebec..	65,094	87,876
Ontario..	1,304,400	913,080
British Columbia..	1,234,000	863,480

Historians differ as to just where the first apples were grown in Canada. Both Nova Scotia and Quebec claim the honour but one thing is assured and that is that for nearly three centuries this species of fruit has been ripening in Eastern Canada.

Apples have been grown in commercial quantities in Nova Scotia for the last fifty or sixty years and the industry has now reached extensive proportions. The largest crop produced to date in Nova Scotia was harvested in 1921 when 2,036,065 barrels were packed and sold from the Annapolis and adjacent valleys, which form the great producing district of the province and cover an area about one hundred miles long and from six to eleven miles wide.

In Quebec there are records that show that as early as 1663 apples were being produced in that province, and it is thought that the renowned Fameuse apple originated there. In the valleys of the Ottawa and St. Lawrence rivers and throughout the Eastern Townships there are many thousands of acres bearing apples, while in many other parts of the province good apple producing areas are to be found.

Ontario is normally one of the largest producers of apples and there is a considerable quantity of each year's crop exported. However, there still remains good orchard lands untouched. The now famous McIntosh Red apple, which for the second time in successive years has been declared the finest dessert apple in the British Empire, was first produced on the farm of the late John McIntosh at Iroquois.

Apple growing in British Columbia was only begun in comparatively recent years but the development of commercial orcharding has been very rapid, the greatest planting taking place between the years 1909 and 1914. The most noted district is that of the Okanagan valley where some of the best orchards in the province and in the Dominion are to be found.

In Prince Edward Island the culture of apples has not developed as rapidly as the climate and soil would justify. Owing to the comparatively cool summer

and autumn which causes slow ripening, the fruit keeps as long or longer than in any other part of the Dominion. Apple trees were introduced into this province about 1763.

While apples in commercial quantities have not so far been produced in the Prairie Provinces—Manitoba, Saskatchewan, and Alberta—considerable attention is being given to their culture, more particularly in Manitoba. Small apples or crab-apples can be successfully grown in many places in Saskatchewan, as well as some apples of the very hardy Russian varieties. The best results in apple growing in Alberta have been secured in the southern districts where a good quality has been produced.

The apples from Ontario, Nova Scotia, and British Columbia are well and favourably known in the markets of Great Britain and Europe and are in constant demand. Quebec, New Brunswick, and Prince Edward Island are at present producing only sufficient quantities for home consumption notwithstanding the fact that the possible producing area is far in excess of that at present under crop and that the climate and soil in all three provinces make for the growing of large quantities of the finest fruit. Experiments are being carried on in the Prairie Provinces with a view to developing varieties more suitable to the climate and when these are obtained there is no doubt that apples will be grown much more generally throughout the Dominion.

## INDIANS CONTINUE TO ADVANCE AND PROSPER ON FARMS

(Continued from page 1)

serve have been removed to and established in the southern portion of the reserve, where the soil is well adapted for grain growing. This year they had about 5,000 acres under summer fallow and over 7,000 acres in wheat which yielded about 32 bushels per acre and graded No. 1. Their farms vary in size from 65 to 175 acres. These Indians are carrying on their farming operations without any assistance from the Department in the way of plant and during the last two years have spent over \$100,000 in equipment. Most of them are well provided with good quality machinery and suitable buildings. In the outlying districts, however, hunting, trapping, and fishing are still followed by the Indians and provide their main source of livelihood, and possibly will continue to do so until the hunting grounds are encroached upon by civilization.

## AREAS UNDER PRINCIPAL FIELD CROPS

The total area in Canada estimated to be sown to the principal field crops for 1924 was 56,164,767 acres, as compared with 55,310,092 acres in 1923. Wheat occupied 22,504,658 acres; fall wheat a harvested area of 773,945 acres; and spring wheat 21,730,713 acres. The area sown to oats was 14,480,568 acres; to rye 890,652 acres; and to flaxseed 1,275,314 acres.

The packing industry slaughtered 2,256,394 hogs in inspected establishments in Canada in 1923, an increase of 329,182 over 1922. The numbers of cattle and sheep slaughtered were 812,142 and 499,745 respectively.

\* Prepared under the direction of Dr. J. H. Grisdale, Deputy Minister of Agriculture, by Mr. J. B. Spencer, B.S.A., Director of Publicity.



# NATURAL RESOURCES CANADA

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OTTAWA, DECEMBER, 1924

## OUR RECREATIONAL RESOURCES

(Continued from page 1)

Above all, our recreational resources are at close market range. There is not a single class of resource under competitive development in Canada today which enjoys such commercial advantages as are commanded by the Dominion's scenic, sporting, and other recreational areas. Their greater development is not a matter of cost of production, of overcoming high transportation charges or tariff barriers. It is almost wholly a question of effective marketing—with a large and wealthy market close at hand.

### DEPARTMENT'S DEVELOPMENTAL WORK

In regard to this phase of natural resources development, the Department of the Interior is undertaking to play as constructive a part as it has played in past years with respect to the country's assets in arable lands, water-powers, and other resources. With a broad, national outlook it is extending to the development of a solid, permanent tourist trade every aid which is properly a federal charge. The scope of its work includes several main activities.

First, the Department has set aside certain areas of the federal domain to be protected and administered as recreational resources. The primary purpose of these areas, known as National parks, is to serve the people of Canada as great, permanent national playgrounds. At the same time they are available as a strong attraction to the vacationist from abroad. They have a total area exceeding 9,500 square miles and have been chosen by reason of their scenic beauty, historic interest, or value as wild life sanctuaries. The Department has made heavy investments in making the parks accessible and revenue-bearing. To-day they form a chain of improved properties—productive public utilities—of the greatest value in attracting the tourist and in giving him his money's worth when he arrives. The whole parks policy, viewed as a business enterprise, follows the principle that every area of the public domain should be developed in line with its most productive use—whether it be for farming, ranching, forestry, recreational, or other purposes. In the practical working out of this policy the Department has already laid a massive cornerstone for the tourist business in Canada.

Secondly, as part of its established information service on Canadian resources the Department is assembling all available data on the character of the Dominion's recreational assets, where they are, and how they may be reached and enjoyed. This work includes the collection from reliable sources of detailed data as to sporting fisheries, big and small game shooting

## SUPREMACY OF MARQUIS WHEAT

Since Marquis wheat was first introduced, a good many growers and breeders have been making selections from it with a view to producing, if possible, an improved strain. From results obtained so far it seems quite clear that differences of greater or lesser importance actually exist. Before it will be possible to recommend one strain of Marquis over another, several years testing will be necessary, however.

While certain new varieties bid fair to replace Marquis in the West, yet until these varieties have been tested further, the supremacy of Marquis as a general variety for most parts of Western Canada will remain unchallenged. At the present time, it is estimated that approximately 90 per cent of all the spring wheat grown in Western Canada consists of the above variety, while in the United States, statisticians claim that approximately 70 per cent of the spring wheat growing areas of that country is devoted to the production of this variety.

grounds, scenic motor and canoe routes, and so on. It is practically a survey of the recreational resources of the country and is really the foundation work that must be done before a full commercial return from these resources can be even approached. Only by such a survey can a prompt and accurate information service be afforded to sportsmen, motorists and other visitors from abroad who desire to have their trips well laid out in advance.

Coupled with the work of assembling this information is the equally important task of seeing that it is widely and effectively circulated. To that end the Department employs a great variety of educational and publicity media. It prepares and distributes a wide range of maps, pictorial exhibits, illustrated lectures, reports and press articles. For instance, both through its own mapping activities and through co-operation with private publishers it is bending every effort toward meeting the remarkable demand which has arisen just within the past two or three years for tourist maps. The whole of the Department's long experience in disseminating information on Canadian resources is being focussed on the purpose of seeing that Canada's recreational attractions are made no less widely known than her opportunities to the settler or business man.

The third main field of Interior Department effort on behalf of the development of recreational resources is that of co-ordinating, so far as is necessary and possible, the work of local and private interests variously engaged in similar activities. This work of co-ordination in a broad way is as yet but barely commenced although the Department has been for some time co-operating with the more active tourist associations, railways and other interests. It is evident, however, that the whole framework of tourist business organization can be greatly strengthened—not so much by an agency bent on centralizing as by one working to remove the lack of co-operation. The Department has been urged to take up this duty and has entered upon it with the view of rendering such co-operative service as has been found indispensable in other developmental programs of national breadth.

Finally it may be pointed out that in its equipment for getting and handling tourist business, Canada today stands just about where it stood in 1898 or 1900 in regard to the handling of land settlement. In the latter case the machinery was quickly provided to enable the country to realize upon its opportunity to obtain settlers in great numbers. In the present instance no new departmental machinery is required but, by turning the facilities already available to the best account, there is every reason to believe that a growth in the Dominion's returns from its recreational assets,

## CANADA'S "BARREN LANDS" ARE FOUND TO BE PRODUCTIVE

SURVEY REVEALS MANY FORMS OF PLANT LIFE

Practical Water Route Discovered Connecting with the Coppermine River

Although nearly one-sixth of the area of the Dominion is included under the name of the "Barren Lands," there has been very little authentic information available about their nature and possible resources. Most of the exploration throughout these regions was carried on in the earlier days—from 1770 to 1834—in the way of various overland journeys in connection with Arctic expeditions by sea, searching for a Northwest passage to the Orient. These lands then lay far from the outposts of settlement and, with the primitive forms of transportation available at that time, estimations of their possible value and resources were bound to be based upon restricted standards.

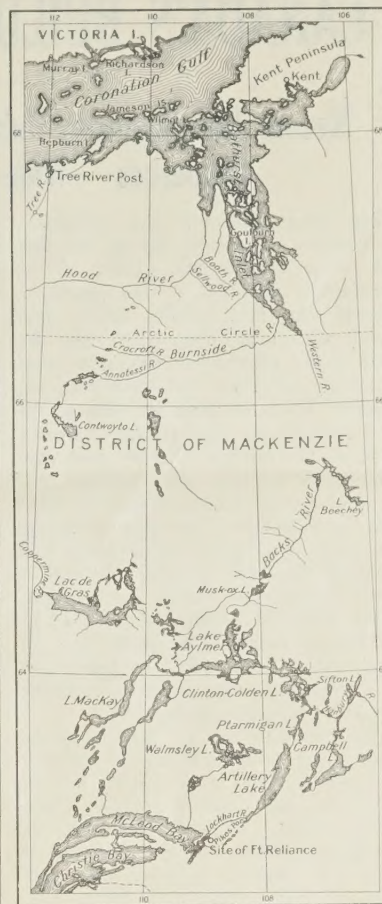
From the close of that period of exploration to the present day, over a span of nearly a century, with its great strides in settlement and in the development of transportation and economic machinery in general, little has been done to reconsider the possibilities of these regions in the light of present-day conditions. In order to obtain first hand information about the country, and at the same time lay down a skeleton system of survey for all possible future development purposes, control traverse and exploration surveys were extended during the past season through a series of waterways lying to the north and east of the easterly part of Great Slave lake. This work was carried on by G. H. Blanchet, D.L.S., of the staff of the Topographical Survey of Canada, Department of the Interior.

The waterways followed consist of a series of large lakes draining to Great Slave lake which lie in a great plateau region of uniform elevation and generally subdued topography. This represents the drainage peak of the country in which some of the waters flowing into the great rivers of the north take their rise—Mackenzie river of the western Arctic, Coppermine river of the middle Arctic, Backs river of the eastern Arctic, and Thelon river flowing to Hudson bay.

The coast line included between the mouths of these rivers exceeds 1,500 miles. It may readily be appreciated that as the head waters of all these rivers closely approach the lake series the route by these waters is important in giving access to a vast area of inland country and an extensive stretch of coast line. In this connection it might be noted that a practicable water route was discovered in the course of the

relatively as great as that produced in its agricultural life, can be achieved. To that objective the Department of the Interior can contribute essential constructive aid—recognizing at the same time that the question of success or failure in this as in any other enterprise rests mainly on the measure of private initiative devoted to those phases of the business which do not come within the purview of the Federal Government.

The Federal Government's active interest must be along such general and broad lines that all provinces will share the benefit. Conversely, the maximum results to the whole country can be achieved only by the proper co-operation of all interests whether they be public or private, local, provincial, or federal.



Canada's "Barren Lands"—A comparison of the lower part of this sketch with current maps will show the extent of errors, both in position and shape, of the waterways as hitherto shown.

survey connecting with Coppermine river.

It was observed that the country became less rough toward the north and east and that the accumulation of soil was greater with a corresponding improvement in the amount and variety of the vegetation. The name "Barren Lands" as applied to the greater portion of this country is a misnomer. It is true that trees do not grow beyond a certain line, and to the north and east of this line areas of barrenness exist where soil is either lacking or too coarse for ordinary plant life, but in the greater portion of the country a variety of shrubs and mosses cover the hills and grasses flourish in the swampy valleys.

The animal of outstanding interest, native to the country, is the Barren Lands caribou. Vast herds range these areas, leaving the open lands for the woodlands for a short period in the depth of winter. The country traversed forms the outer fringe of the former range of the musk-ox and from the fact that only one was seen during the season it may be assumed that either the herds have been reduced in numbers or they have retired to the more inaccessible portions of their range. An interesting discovery was that a summer breeding ground of the ivory bill loon which winters in Norway and Iceland was found in the upper waters of Coppermine and Backs rivers where hundreds were observed.

The reports received by the Department of Marine and Fisheries are to the effect that heavy runs of sockeye salmon reached the spawning grounds of Lakelse lake and Babine lake on the Skeena River watershed. The hatcheries located at these two points were filled to capacity with over 17,500,000 eggs and large numbers of salmon were left to spawn in the natural way. The collections at both places were well above the average since the hatcheries were established.



# CANADA'S BUILDING MATERIALS

## Recent Developments Indicate Extent of Dominion's Resources—Wide Range of Supplies

The developments in the production of building materials during the last few years indicate the extent of the Dominion's resources in this regard. In Canada the first settlers built their homes with logs; then those who desired more substantial dwellings used the stone resources and sometimes the boulders they removed in making the land suitable for agricultural purposes. Later as the lumber industry grew, the frame-house became more popular and the majority of dwellings erected since then have been of this type except in the cities and bigger towns where the tendency has been towards the use of more fire-resisting material. According to the 1921 census 73 per cent of the houses in the Dominion were of wood, about 22 per cent of brick, and the remainder of stone, concrete, gypsum, and other materials.

Clay products usually have been the most economical materials for exterior construction and brick plants are in operation near most important cities. Suitable clay and shale deposits are widely distributed throughout the provinces and excellent products are made which compare favourably with imported materials. During recent years hollow burnt-clay building blocks have become popular and many artistic dwellings, industrial and public buildings are erected with these blocks and finished with brick or stucco.

It is a matter of history that early builders knew and utilized the secret of synthetic stone (concrete) in the building of their permanent structures. Science has so improved upon these age-old secrets that to-day we have a building material as enduring as stone, a ready servant of both architect and builder. The result has been that the use of this material has greatly increased in the past two decades. Owing to well distributed resources of high grade materials Canada holds an important place in the portland cement industry, producing in 1923, 7,677,196 barrels of cement, valued at \$15,417,587, of which 493,751 barrels, worth \$824,811, were exported.

The erection of buildings, combining both permanence and attractiveness, may be effected by using some of the better grades of Canadian stone. Suitable building stones include the limestones of Portneuf county, Que., Niagara, Ont., and Tyndall, Man.; sandstones from Wallace, N.S., and Gloucester and Westmorland counties, N.B.; and the many granites of Eastern Canada and British Columbia. For interior decoration, there are the handsome variegated and other marbles of eastern and central Ontario, the delicately tinted marbles of the Eastern Townships of Quebec, and those of the Kootenay district, British Columbia. These with many other building stones found in most of the provinces provide materials with which to erect excellent buildings without recourse to imported stone.

Although structural steel, reinforced concrete, gypsum, and asbestos products are now largely used for modern buildings, much timber is required in some form or other in every building; in fact, in some districts houses are built entirely of Canadian woods. There are certain species of trees such as mahogany, teak, etc., that cannot be grown in this country; these woods we must import for use in various industries, but in the building industry there

are Canadian woods for every purpose. In eastern Canada, there are such softwoods as pine, spruce, and hemlock, and such hardwoods as birch, maple, basswood, ash, beech and oak. In the West the immense forest resources of British Columbia are capable of supplying for construction and other purposes various timbers of which Douglas fir is the most important and for its weight and the large sizes in which it can be



Canada's Building Materials—Quarrying sandstone in Eastern Canada. The sandstones of the Maritime Provinces are among the important building materials of the Dominion.

obtained the strongest structural timber in the world. The demand for this species both in Canada and for export is steadily growing and in 1922 more than 820 million feet board measure were sawn in the mills of the province. British Columbia also produces other woods such as western hemlock, western red cedar, western yellow pine, larch, and spruce all of which are suitable for both structural purposes and interior finish.

In addition to the problems in connection with the utilization of our resources there are many others in the building and construction industries that offer opportunity for careful technical research. As the total expenditure for new construction in Canada each year amounts to a very large sum it is obvious that comparatively small economies in the production of building materials and methods of their application result in a large saving. Several departments of the Dominion Government are constantly working with a view to conserving our resources of structural materials and improving methods of production.

The expansion of the home market for such construction materials as steel, lead, architectural terra-cotta, glass, slate, oils, and varnishes, many of which are at present imported in considerable quantities, will result in a fuller development of the Dominion's resources in building materials.

The rapid growth of the butter industry in the province of Manitoba promises to make it a strong competitor in the European markets. In 1914 the output of butter in Manitoba was 3,889,000 pounds and in 1924 12,500,000 pounds, the province leading the whole Dominion as a prize-winner in this particular industry.

# DOMINION'S FORESTRY SITUATION

## Need For Adequate Protection of Natural Timber Lands and Sane Utilization

The outstanding necessity in the forestry situation throughout Canada to-day lies, firstly, in the appreciation of what forestry really is; secondly, in the definite and appropriately balanced application of several phases of forestry in our practical everyday timber business. Setting aside those who neither know nor care what forestry is, the public may be divided into three classes: first, those that conceive of

management and protection timber has the power of reproducing itself naturally; knowing, on the other hand, that with bare land and with seed it is possible to establish forest growth which in the course of years may be built up into a stand of valuable timber; it is well to consider which of these two broad methods is the more applicable to Canadian conditions.

Planting may entail expenditures varying from \$15 to \$25 per acre—even more, if heavy transportation charges have to be met. The definite tangible results secured by this method, however, strongly appeal to the public imagination; so much so, that people are liable to overlook the relative cost. As nowhere in Canada are amounts greater than 3 or 4 cents per acre being expended in the protection of natural woods (usually very much less than that), it is evident that the use of funds at rates of from \$15 to \$25 per acre over comparatively small areas would entirely exhaust forestry appropriations, leaving nothing for the protection and administration of the valuable timber resources made available by nature.

As a result of intensive utilization in earlier years, there was necessity for engaging in extensive planting operations in Europe; in Great Britain it is only by such means that the forest can be re-established. While the method of artificial reforestation provides for more rapid and more consistent growth, the method has nevertheless inherent disadvantages, altogether aside from cost, which even in Europe are causing the authorities to return to methods more closely approximating those of nature. This being the experience in countries where forestry has been practised for generations, how foolish it would be for Canada to consider planting as her main problem in providing future timber supplies. Undoubtedly Canada will engage to a considerable extent in plantations, for only by this means can certain neglected areas be brought once more to a state of productivity. The high cost of planting is the price which must be paid for past carelessness in the treatment of natural forests; to these costs we must submit if in some districts we are to have anything else than weeds and waste. Having re-established the forest on such waste lands, however, future methods of forest regulation will aim once more at natural regeneration.

Notwithstanding the local or regional importance of tree-planting projects, Canada must be careful not to lose sight of the fact that her main problem lies in the rational treatment of natural forest lands. Aside from Prince Edward Island, the Yukon and the Northwest Territories, Canada's total forest area is nearly 1,250,000 square miles, of which more than 440,000 square miles is rated as merchantable and accessible forest. The logical course, therefore, is to improve fire protection until it is really effective, otherwise circumstances will inevitably impose production costs of \$4, \$5, or \$6 per cord (double that amount per thousand feet) on our wood material.

Canada must recognize as her main forestry problem the more adequate protection of natural timber lands, and the utilization of the latter under methods which encourage the reproduction of timber. She must abandon the wasteful methods which are nothing more than "timber-mining," and adopt in their place the methods of cropping timber. Only by such methods may Canada hope to retain for long her position as a contributor to the world's softwood markets.

forestry as consisting solely of fire protection; second, those who consider that it is tree-planting; third, those who know that it not only embraces both of these fields of endeavour, but also far more.

Fire protection is of fundamental importance, and only as its problems are solved for various districts will it be economically practical to apply the more intensive methods of forestry proper; for many years it must necessarily absorb the greatest amount of time and energy on the part of the various forest services, yet even when the ideal is reached—fire-proof forests, Canada-wide—we shall not even then have attained the objects of forestry.

Nor does forestry consist merely in tree planting. A brief comparison between tree-planting, as a means of perpetuating the forest, and the method of natural regeneration through proper care of existing forests, will give a clearer perspective as to the main forestry problems facing Canada to-day. Recognizing that under proper

An Alberta judge not long ago assessed damages to a planted wind-break at \$1,000. In this case the wind-break was not destroyed, but merely damaged and was quite capable of repair.

With the object of improving the stand of timber on Dominion forest reserves in Western Canada, and reducing the annual loss from insects, fire, and disease, attention is being constantly directed to the cutting of overmature and dead timber. This system supplies the miners and settlers with the needed timber and at the same time cleans up the forest and gives room for new growth to come in.







